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TRANSACTIONS

OF THE

CALIFORNIA

State Agricultural Society

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DURING

THE YEARS 1866 AND 1867.

SACRAMENTO:
D. W. GELWICKS, STATE PRINTER,
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INTRODUCTION.

In preparing this, the tenth volume of Transactions of the State Agricultural Society, for publication, the chief aim has been to present to the reader a truthful index of the resources of the State and their present stage of development. Experience has taught us that, among the many patrons of the Society, each one expects to find in the report of its transactions something interesting and instructive touching not only every branch of industry now pursued in the State, but also some information relative to every branch that might or should be introduced. We have, to a certain extent, endeavored to answer this expectation; and while to succeed fully we know would be an impossibility, yet we believe we have not entirely failed, and we hope the present volume will prove not only interesting but valuable to all classes of the community.

The Society recognizes Agriculture, which must always be the chief occupation of our people, as its prime object of support; but as all other branches of industry are closely allied to and dependent upon Agriculture for their existence and prosperity, so the Society recognizes all industrial pursuits as among the legitimate objects of its fostering care.

While one of the principal means of aiding in the developing of the State's various resources is the holding of Annual Exhibitions of all the products of industry by the Society, another and no less important one is the keeping a correct and reliable record of the progress of such developments, whether accomplished through the direct or indirect aid of the Society. Such records are more valuable and reliable when made by men of actual and practical experience in each department of industry. Bearing this fact in mind, the Board of Agriculture has made it a rule to give to each industrial pursuit a voice and a pen, and encourage their use for the benefit of all. The statements of the several claimants for the gold medals awarded by the Society for the most meritorious exhibition in each of the several general departments of industry into which the last Annual Exhibition was divided, forming as they do a new and very interesting feature of this volume, indicate the success which has attended the efforts of the Board in this particular direction.

The reports of the various Commissioners to the Paris Exposition, both from this State and the National Government, will be read with much interest, and will repay a careful examination by all who do or do not believe that California is fast assuming the position which nature seems to have assigned her—as the Eden of the world. The report of our own Commissioner, Professor William P. Blake, is very full and valuable; and while his services were undertaken and performed gratuitously, we think the State should recognize the value of such service by a substantial compensation.

46047

The valuable Essay on the Agricultural Resources of California, by H. D. Dunn, published as it has been by the Commissioner of Agriculture of the General Government in his last annual report, has been the means of attracting the attention of thousands of reading and thoughtful men in all parts of the world to California and her many advantages, and well merits a republication by the State from which it originated.

The various articles on silk culture are opportune and valuable, appearing as they do at a time when this most important industry is assuming that position among the other industries of the State warranted by its peculiar adaptation to our soil and climate, as well as by its decline and symptoms of final failure in the old countries which have heretofore enjoyed its exclusive product and its unparalleled profits. France, Italy, Germany, and even China and Japan, are yielding to California the enviable and substantial distinction of being the best country on earth for the production of that most valuable fabric known to man in ancient or modern times—*silk*. California, through her Legislature, has recognized the importance of this industry by offering liberal bounties to those who shall successfully engage in it, and the people will not be slow in seconding the efforts of their Legislature to introduce and profit by this industry.

In accordance with a supplemental report and recommendation of the Committee on Gold Medals—which was not received in time for insertion in its proper place—the Board at a late meeting awarded an extra gold medal to Isador Landsberger, of San Francisco, for sparkling wines, and to the San Francisco Glass Works, for their exhibition of California manufactured glassware.

In the Appendix will be found the premium list and rules governing the Society's Fair, to commence on the fifteenth and close on the twenty-fifth of September, eighteen hundred and sixty-eight.

In conclusion, the Board would congratulate all the industrial classes of the State, and especially the agriculturists, upon the bright prospects before them, and would urge them to improve their opportunities and reap the rich reward which industry and frugality are sure to bring.

For the Board.

I. N. HOAG, Secretary.

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BIENNIAL REPORT

OF THE

BOARD OF AGRICULTURE

OF THE

STATE AGRICULTURAL SOCIETY

FOR THE YEARS 1866 AND 1867.

STATE BOARD OF AGRICULTURE FOR 1867.

PRESIDENT.

CHARLES F. REED .....Grafton, Yolo County.

DIRECTORS.

C. T. WHEELER.....Sacramento.
JOHN H. CARROLL.....Sacramento.
EDGAR MILLS.....Sacramento.
B. R. CROCKER.....Sacramento.
T. L. CHAMBERLAIN.....Placer.
WILLIAM P. COLEMAN.....Sacramento.
A. G. RICHARDSON.....Sacramento.
ROBERT BECK.....Sacramento.
R. B. WOODWARD.....San Francisco.

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SECRETARY.

I. N. HOAG...Yolo. P. O., Sacramento.

TREASURER.

R. T. BROWN..... Sacramento.

CHEMIST AND METALLURGIST.

Dr. R. OXLAND, F. C. S...San Francisco.

GEOLOGIST.

Prof. WM. P. BLAKE.....San Francisco.

METEOROLOGIST.

T. M. LOGAN, M. D.....San Francisco.

ZOOLOGIST.

J. G. COOPER.....San Francisco.

ENTOMOLOGIST.

H. H. BEHR, M. D.....San Francisco.

BOTANISTS.

A. KELLOGG, M. D...San Francisco. Prof. H. N. BOLANDER, San Francisco.

REPORT.

To His Excellency
H. H. HAIGHT,
Governor of California:

Since the last Biennial Report of the Board, dated January first, eighteen hundred and sixty-six, the Society has held two annual Fairs for the exhibition and encouragement of the industries of the State. At the Fair of 1867, the Mechanics Institute of San Francisco took an active part in inducing their members and others from that city to send up the products of their genius and industry, and in this manner contributed very materially to the interest, extent and value of the Fair.

There has been established between the State Society and all other co-operative Associations established in the State, a good understanding, and it is very desirable that these friendly relations may be continued, as we are working for one common object—the good of all the industries of the State.

In obedience to law we submit the following tables, which show an abstract of receipts and expenditures of the last two years, and also the present indebtedness of the Society.

RECEIPTS AND EXPENDITURES FOR 1866.

RECEIPTS.	
Cash on hand January 1st, 1866	$ 256 35
Received for rent of Park and buildings	1,200 00
Received from State (annual appropriation)	4,000 00
Received from members' dues, sale of tickets at Fair, and other sources connected with the Fair	14,430 50
Total receipts for 1866	$19, 886 85
EXPENDITURES.	
Amount paid for premiums	$ 9,742 60
Amount paid for old indebtedness	2,541 94
Salary to Secretary	1,800 00
Expenses of Fair and other expenses dependent on it	5,555 42
Total	$19,639 96

RECEIPTS AND EXPENDITURES FOR 1867.

RECEIPTS.	
Cash on hand January 1st, 1867	$ 246 89
Received from rent of Park	1,600 00
Received from State (annual appropriation)	4,000 00
Received from sale of membership tickets, and other sources	18,624 10
Total receipts for 1867	$24,470 99

EXPENDITURES.	
Amount paid for premiums	$ 9,954 45
Amount paid for repairs and improvements at stock grounds	1,266 86
Improvements at Pavilion	3,433 05
Old indebtedness	641 95
Salary to Secretary	1,800 00
Other expenses of Fair	7,382 92
Total expenditures for 1867	$24,479 23

Leaving a deficit on that day in the Treasury of eight dollars and twenty-four cents.

The Society is now owing on an old indebtedness created prior to eighteen hundred and sixty-three, the sum of three thousand three hundred and ninety-three dollars and fifty-three cents.

The damage done to the Society's buildings at the stock grounds by the late high winds is estimated at one thousand dollars. A special appropriation of that amount is respectfully asked for the repair of the same.

Thus it will be seen from the growing patronage of the Society, that it is steadily increasing in interest and favor with the industrial classes of the State, and stimulating them to exertion and emulation in their various occupations and in the development and practical utilization of our resources.

It is annually distributing from eight to ten thousand dollars in premiums among all classes, for the most meritorious productions of our farms, our mines, our manufactories and galleries of art, and bringing together tens of thousands of inquiring people for the inspection of these products, and for the interchange and quickening of thought in regard to improvement in all industries and relations of life.

Through the influence of the Society new products of industry are being annually added to the list of our exhibitions, and calling for their share of patronage and encouragement.

Thus, while the field for the Society's usefulness is constantly increasing, so in the same proportion increases the necessity for additional means for distribution. The premium list for eighteen hundred and sixty-eight should embrace many more objects than that of eighteen hundred and sixty-seven, and consequently in the aggregate should be much larger.

Money appropriated by the State to encourage old and create new industries is unlike that appropriated for any other purpose. It is merely put out at interest. Every dollar given through the medium of the Society, for premiums judiciously distributed, adds money to the taxable property and consequent wealth and revenue of the State. The Board, therefore, believe it would be sound policy for the Legislature to increase the annual appropriation, and ask for this subject a favorable consideration.

ORGANIZATION OF COUNTY SOCIETIES.

While the State Society aims to encourage and stimulate all our material interests, and is the authoritative medium, through its reports and correspondence, for the conveyance of a correct knowledge of our resources and many advantages to the people of other States and countries, yet its usefulness, both at home and abroad, would be very much enhanced by the organization of co-operative societies in at least every county of the State. These societies would beget local pride, and stimulate the development of local resources. They should be required to make annual reports of their transactions to the State Society, and in this way they would become the mediums for the concentration and dissemination of much valuable information that cannot be obtained through any other channel.

With such a system of societies, organized with a definite object and directed with skill and ability for the accomplishment of that object, it is believed that the labor and skill of our people can be rendered much more productive, and the resources of our State much more rapidly and satisfactorily developed.

This Board has frequently urged these considerations upon the people of the several counties; but while all admit the practicability of the plan, and the benefits likely to follow its adoption, yet we have comparatively but few such organizations, and the State is receiving but few of the benefits which should be flowing from them.

The sanction and aid of the Legislature, it is believed, would assist much in accomplishing the object desired. A small appropriation to each County Society that may be organized and make its annual report to the State Society, only to be drawn on condition that such Society raise and distribute an equal or greater sum for premiums, it is believed would be effectual and commendable.

THE AGRICULTURAL AND MECHANIC ARTS COLLEGE.

From the earliest history of civilization, and in all countries where much progress has been made in the arts and sciences, there has been established and supported schools and colleges for the direct purpose of educating and especially preparing for their intended calling all those who propose to follow any of the so-called learned professions.

These schools have, in most countries, received the liberal aid and patronage of the Governments, and their prosperity and efficiency has been generally very much enhanced by such aid and patronage.

The idea of establishing schools and colleges for the education of the industrial classes, and especially fitting the members of such classes for the particular occupations they may be intending to follow, is of a much later date. It is one of the best and most practical ideas of this practical age. It is one of the choicest fruits of the democratic tendencies of the present century, and if properly nourished and cultivated by itself, so as to retain its native and distinct strength and purity, there will grow up from it a tree with branches sufficiently high and broad to shelter all the nations of the earth and protect them from the degrading influences of the combined monarchies of the world.

Our National Congress reflected the spirit of the age and of democratic institutions when they made provision for the establishment of one of these colleges in each of the States of the Union. They also foresaw the great danger with which they would be beset—that of being blended with and swallowed up by other existing institutions more exclusive in their organizations and objects, and less democratic in their tendencies, and very wisely endeavored to guard against such a contingency. Our last Legislature, in the law for the organization of our Industrial College in this State, and in the election of a Board of Directors for its management, showed that they were also actuated by the same jealous care and prudent considerations in this behalf.

They very wisely provided that the Directors should always be selected from different portions of the State, and that they should ever continue to be the representative men of the various industrial classes, for the especial benefit of which the college was to be established and supported.

It is intended to be emphatically the people's college, and should be controlled only by men who by their positions and occupations are constantly circulating among all classes of the people and in all portions of the State; hence the propriety of providing that the Governor of the State, the President of the State Agricultural Society, and the President of the Mechanics' Institute of San Francisco, should ex officio be members of the Board of Directors, and that the other members of the Board should be equally divided between those sections of the State representing her two great leading interests.

It is hoped, whatever changes may be made in the law, that this eminently proper provision may not be disturbed, either in letter or in spirit. The very name given to these institutions by Congress shows the propriety of connecting with their management the first representative agricultural and mechanical men of the State.

The provisions also secure the college against the probability of assuming a political, sectarian or local character.

IMMIGRATION.

This is a well worn subject, and yet its importance to the prosperity of the State is so great that it cannot be passed over in this communication to the Legislature without a violation of our sense of duty. For

the last ten years it has been evident to all who have given the subject a careful thought, that nothing would contribute so much to the advancement of our prosperity as a commonwealth, as the influx of a large immigration of industrious citizens. Every class of the community experiences the want of labor. Every department of industry needs the stimulus only to be found in a plenty of labor adapted to its wants.

Our resources are so much greater than our ability to develop, that the demand for immigration may be said to be universal.

There is no principle in political economy more thoroughly established or more generally acknowledged than that a State cannot come up to its natural standard of prosperity without sufficient labor to develop and husband its resources.

When we see a farmer, a miner, or manufacturer, attempting to do three or four times as much work as he can command means and labor to accomplish, and accomplish well, we do not expect to see him succeed and he never does succeed, but generally makes a disastrous failure. The present condition of our State, possessed as we are of a great variety and abundant resources without a corresponding amount of labor and means, is just calculated to induce our enterprising and energetic citizens to this very course.

Our most enterprising men frequently fail in their undertakings simply from the fact that they cannot command sufficient labor at reasonable rates to carry through to a successful conclusion their enterprises.

We need not cite proofs of the necessity of immigration to our State. The proposition is universally acknowledged. The only questions now open for discussion are, how shall we secure the most valuable immigration in the shortest space of time and in the most economical manner. Many plans are proposed, many schemes are advocated—some purely and disinterestedly for the public good; others with evident designs for private and individual speculation more than for the benefit of the State. All parties, whatever may be their favorite plan and whatever motives may prompt them to the advocacy of this plan, know full well that legislative sanction and aid for the furtherance of their object is much to be desired. As a general rule, the Legislature will find those plans which are designed most for the benefit of individuals and least for the benefit of the State will be advocated with the greatest apparent disinterestedness, but at the same time will be clung to with the greatest tenacity and urged with the greatest importunity by individuals who, either for themselves or for their friends, expect special and peculiar benefits. While, therefore, we would thus counsel caution, we would at the same time most earnestly urge action on the part of the Legislature in this matter.

There is undoubtedly a great lack of information as to the real position, advantages and resources of California even among the people of the Atlantic States, and particularly so among those of European countries from which our immigration would be most desirable.

Then, the first point to be accomplished should be to reach those countries and those people with correct information in regard to every department of industry in California. We want to show them in an authoritative and reliable manner, through some channel upon which they could and would depend and rely for correct information, the extent of our agricultural, mineral and manufacturing resources; the extent to which they are already developed; the facilities for continuing to develop them; and the liberal remuneration, both to capital and labor, which can be secured by those who will come and assist in their development.

We want to show them more in detail the quality of our soils; the nature and advantages of our climate; the kinds and quantities of the necessaries and luxuries of life that can be produced here; and when and at what prices those necessaries and luxuries can be sold; and what are the means and expenses of their transportation to such market.

We want, in fact, to show them, as we can, that California is the best place in the world for the industrious rich man to increase his riches, and the industrious poor man to become rich—the best place in the world for all classes of industrious people to live easy and happy. Now, how shall this information be conveyed to these people? The Legislature will not be troubled in finding plenty of individuals ready and anxious to answer this question in a manner at least satisfactory to themselves. They will not be troubled to find a plenty ready and anxious to organize themselves into Immigrant Aid Societies, and as ready and anxious to receive from the State from fifty to one hundred thousand dollars per annum for the next five or ten years to assist them to carry out their plans. They will not be troubled to find, also, that many of these persons, disinterested as they may appear, are already the owners of large tracts of land in some particular localities, which they would willingly sacrifice at a small price per acre to the immigrants whom they could induce to come here with the money received from the State.

The Legislature will not be troubled much to find that such is the real object of many who are so wide awake to this all-absorbing subject of immigration, and so willing to offer their services or the services of their friends for the organization of Immigrant Aid Associations. Even such Associations might, with the aid of the State, accomplish much good, but that good would not be so general, and not of a character so broad and liberal as the State desires to accomplish. Associations got up with such motives, or even if suspected of such motives, would be comparatively powerless for accomplishing the object desired both at home and abroad.

In this connection we would call the attention of the Legislature to the fact that there is now in the State several organizations which have been laboring for years past, with limited means, it is true—and this is no fault of theirs—not only to induce immigration to this State, but to direct, and aid and assist it when here by the publication and distribution of just such information as is above described, both in foreign countries as well as at home.

And these Associations have not worked without effect. They have at least made their names, and their motives are known abroad, and whatever information they had the means to collect and distribute has been of a character to command the attention and confidence of people both in foreign countries and at home.

They have gained a foothold which it would take any other Association years to gain; and with the proper means and facilities placed at their disposal, are prepared to enter at once upon the work of harvesting the crop which has grown up from the seeds already by them sown.

We refer to the agricultural and mechanical Associations of the State. These Associations have been and are conducted for the general good, unmixed with individual aggrandizement or speculation. If the State would encourage and lead to beneficial results home industry, let her deal liberally with these Associations. If she would distribute useful information abroad, let her do it through the medium of these institutions. If she would organize or incorporate any body of men as an Immigrant Aid Association, and appropriate money to be used in assisting

a valuable immigration among us, let her incorporate the principal officers of these Associations and the Governor of the State, and put the money into the hands of such incorporation. Such an incorporation, composed of the Governor and the leading representative men of the several industries of the State, and carrying with it the names of the Associations above referred to, would at once command the confidence and co-operation of every citizen in the State, and would wield an influence and power in foreign countries which no other Association, composed of individuals, could wield. Such men have already the knowledge necessary to use; they have studied all the questions bearing on the subject of immigration and know how and where to apply that knowledge to produce a desired effect. They have no individual or local ends to accomplish. Their attention has been given equally to the advantages to be offered in all portions of the State. They have studied all the facilities and all the routes leading from the countries from which a desirable immigration can be obtained. Give them the means and they are prepared to answer at once by immediate action the questions above stated: "How shall we secure the most valuable immigration, in the shortest space of time, and in the most economical manner."

With one or two thousand dollars to be offered as premiums for the best essay of from one hundred to one hundred and fifty pages, to cover such subjects as such a Board should name, there could be collected together and placed in reliable shape all the necessary information.

With eight thousand more they could print that information in all the necessary languages, and in six months time could have it generally distributed in all the countries from which it would be advisable to ask such immigration.

Such might be the plan for sowing the seed or awakening a desire among the people in those countries to immigrate here.

While this was going on, with a joint stock Association organized under the management of such men, and with the assistance of the State to the amount say of thirty thousand dollars, facilities could be provided for bringing from the Atlantic States an immigration of fifty thousand persons during the next Summer. We all know that the great line of immigration from foreign countries to the United States is through New York. It might be policy to endeavor to divert that immigration, or some of it, to San Francisco, in time, but it cannot be done to any great extent immediately. The most available source, therefore, from which to secure immediate immigration is from the Atlantic States. From that source can be secured the best class of immigrants in the shortest possible time and in the most economical manner. Then the harvest, from seeds sown by the agricultural and mechanical societies of the State, is already ripe and ready to be gathered.

The people there are only waiting the completion of the Pacific Railroad, and they count the days and weeks when this shall be accomplished, that they may speed their way to the land of gold and plenty. The road will not be completed inside of two years from this date, and yet there is but about twelve hundred miles between the western terminus of the Union road and the eastern terminus of the Central Pacific, and the distance is constantly decreasing. By the time the roads are in operation to their outer points in the Spring the country from point to point will be in good condition for travel, and can be made in thirty days time with light loads, and immigrants can be brought from point to point

for from twenty-five to thirty dollars each. Let the joint stock Association above referred to, carrying with them the influence of the societies named, and the influence and sanction and aid of the State, advertise generally in the Atlantic States that they will convey passengers between these two points in the time and for the price named, and there will be fifty thousand persons who will accept such a proposition during the coming Summer.

It is believed that the Association, with proper management, can bring them all and make money by the operation. The whole subject has been well considered by business men, and figures have been made upon the receipts and expenditures, and they stand ready, under the guidance and name of the Association recommended and such sanction and aid of the State, to undertake and accomplish it. All the necessary outfits, horses, wagons, harness, etc., to be bought in the Atlantic States, and only to run through one trip and be disposed of here.

It is believed that good teams, wagons and harness can be sold here for at least as much in gold as they will cost in the Atlantic States in legal tenders. The increase in population, and consequently of labor and industry, will increase the demand for the very teams that bring that population here. The freight on wagons by water is greater in proportion to first cost than upon most other articles of import, on account of bulk.

In connection with the branch of this subject relating to the kind of immigrants most valuable to the State, it may be remarked that there are now from twenty-five thousand to thirty thousand Chinamen employed in the State at domestic labor, doing housework, and that they are anything but agreeable or profitable help in that capacity. There is a great excess of female over male population in the Atlantic States, and it is with the greatest difficulty that remunerative employment can be found there for females Here female labor is in the greatest demand, and most remunerative. Transfer thirty thousand females from the Atlantic to the Pacific States and these thirty thousand Chinamen will be transferred to labor on our farms or to the more rapid completion of the Pacific Railroad. In either employment their labor is in demand.

Another consideration: By the last census the male population of California exceeded the female by one hundred and thirty-two thousand six hundred and one. As long as such a difference exists, the population of California will remain more or less unsettled and nomadic.

These are subjects which received the grave consideration of the wisest men in the earlier colonial legislation, and they are no less important to California to-day than they were then to all America.

To this whole subject of immigration we respectfully ask the careful attention of the Legislature.

DISEASED CATTLE.

It is known that there has for a long time existed among the large herds of cattle in portions of Texas and some parts of Mexico a disease termed the Texas fever.

The disease resembles in many respects that which from time to time

has made its appearance in the Atlantic States and Europe—a pleuro-pneumonia—and also that disease which is said to have had its origin on the high plains of Russia and has at different periods spread over Europe, destroying so many cattle in its course, called the rinderpest. It is said to be hereditary and contagious.

We are informed that large droves of cattle will probably be driven from Texas to California the coming Summer, and that in this manner there is danger that the disease may be brought with them and thus introduced into our State to the great detriment of our cattle owners. Proper legislation on this subject might prevent the evil.

BRANDING CATTLE.

Our attention has been called by leather manufacturers to the custom of branding cattle in this State in so careless a manner as to damage very materially the hides for many purposes. A large brand burned into the hip of an animal works a great damage to the butt, or best part of the hide for tanning—especially for belt, hose or harness, and sole-leather purposes. A smaller brand on the shoulder would answer every purpose for marking cattle, and would do comparatively but little damage. This evil is one of much greater magnitude than is generally supposed, and it affects very materially the reputation of our leather abroad. A side of leather, however well tanned and finished, if branded as described, is marked as "good—damaged," and a deduction in price is made.

The custom of branding cattle on the hip, and venting with the same brand on the shoulder when the animal is sold, is derived from the native Californians and the old Spanish residents, and we believe is sanctioned by early laws of our State. The sanction of law should no longer be lent to a custom so detrimental to our leather interest.

The brand and vent can both be on the shoulder as well as one on the hip, and thus the damage will be much less. Instead of exporting the raw hides, we are now, to a great extent, tanning them and exporting the leather.

CULTIVATION OF SUMAC.

The manufacturing of leather in our State has become so great an interest that the husbanding and production of the material possessing the principle of tannin used is coming to attract the serious attention of those engaged in the business.

The bark of the oak trees in California is said to possess that principle in greater quantities and in better quality than in other portions of the world.

Our climate is so favorable during the growing seasons of the tree that a greater quantity of the tannin principle is secreted, and for the same reason the quality is purer and better. For the manufacture of the finer qualities of leather and morocco—especially Turkey morocco—

sumac is a prime necessity. This is imported from the southern portions of Europe and the island of Sicily, and costs our consumers here two hundred dollars per ton. The importation into the United States for eighteen hundred and sixty-six, at a cost value in the countries from which it was imported, amounted to three hundred and fifty-five thousand one hundred and ninety-eight dollars.

It is believed that it can be readily raised here, not only for our own consumption but for export, and, for reasons named above, that its quality would be superior.

Our farmers are slow to engage in the cultivation of new products, and therefore we suggest the propriety of legislative aid and sanction to the culture of this article.

WOOL.

From semi-official reports, we learn that the product of our wool for eighteen hundred and sixty-seven was ten million two hundred and eighty-eight thousand six hundred and forty-seven pounds, against seven million nine hundred and eighty-four thousand and eighty-seven pounds raised in eighteen hundred and sixty-six; being an increase of nearly thirty-three per cent. in one year.

This is a very gratifying showing; and probably a better one than could be made by any other State in the Union. It shows the adaptation of our climate to the industry and the immense value this interest is likely to assume in the State at no distant day.

From the above figures, also, we may see the importance of establishing and maintaining a reputation for our California wools which will enable them to take rank with the same grades of wool raised elsewhere.

The fact that our seasons are so favorable for keeping up a uniform condition of our flocks, and a consequent uniform growth of the staple, should enable our California wools to rank even higher than those of other countries.

There is but one reason why this may not be the case; and this reason rests entirely in the hands of the wool growers themselves, to whose benefit or injury a good or bad reputation for our wools must in the end redound.

FRAUDS IN WOOLS.

We regret that it becomes our duty to call the attention of the Legislature to an evil in this connection, which, if not checked, will work a great injury to the interests of the State.

One of the principal wool dealing establishments in San Francisco makes the following statement on this subject:

"A system of fraud practised by wool growers in the interior has been the cause of great annoyances to our manufacturers and buyers. They have found themselves victimized so cleverly as to be unable for a

long time to ascertain the means by which it was done. Purchasers in the interior suffered severely—wool bought by them losing from seven to thirteen per cent. in weight while in transit to this city. After diligent search for the cause of these losses, it was found that quite a number of wool growers were in the habit of sprinkling water on the fleeces before packing them for sale. The evil of this fraud does not end, however, by loss of weight, as the water in connection with the natural grease causes fermentation, which injures the strength of the staple and causes it to be black-yellow instead of white, so that it can only be used for dark colored and inferior grades of goods. Oregon wools, received in this city, have also been found in very bad condition; the fleeces in some cases being mixed with stones, and in others with sheep manure. These adulterations have been made purposely to defraud, the adulterations in some fleeces being *three* pounds each."

We believe that such a state of affairs calls for legislative action. The Legislature owes it to the reputation of the State to provide that such fraud be prevented in future, and we hope that some plan may be devised by which this may be done.

FOREST AND SHADE TREES.

The subject of the influence of trees upon climate is one of great interest to all countries, and particularly so to California. That the woodless plains of our State have to a great extent been produced by fires during the dry seasons, preventing the growth of trees, is scarcely to be doubted, from the fact that any of the trees, by cultivation when young, can be made to grow most luxuriantly. That the uninterrupted rays of the sun falling upon these vast plains, covered as they are in the late Summer only by a dried vegetation, produces in the atmosphere a greater degree of heat and consequently renders it capable of retaining more moisture uncondensed or in vapor form, is a fact well known to science. As a result of this condition of the surface of so large a portion of our State, and of this fact of science, and of the direction of the prevailing winds from the ocean landwards during the Summer season, much of the moisture in the atmosphere is carried inland in vapor form, even over the Sierra Nevada range until it reaches the Rocky Mountains, when being condensed it falls to the earth in an abundance of rain. Thus our dry and parched plains and the prevailing duration of our Summer winds, particularly the upper currents, rob us of Summer showers and give them to regions beyond our borders where they are not needed and do no good.

The very nakedness of the earth's surface at this season of the year becomes the cause which reproduces this same marked nakedness from year to year. Nature has not the power, in this instance, to correct itself or change its tendencies. It must be done, if done at all, by artificial means, and nature itself points out the means of accomplishing it.

First, when in the Fall or Winter here the sun approaches her southern solstice, and her rays fall less perpendicularly upon the earth's surface, the temperature of the land becomes less than that of the ocean, the moisture in the atmosphere becomes condensed and falls to the earth in rain, producing our rainy season.

Again, in all well wooded countries such a thing as a continued dry season with no rain, like our California Summer, is unknown. Now, suppose we were able to cover the whole surface of California with a dense forest to-morrow, and thereby intercepting the perpendicular rays of the sun next Summer, prevent them from heating up the earth's surface and the atmosphere; is it doubted that we would thus cause a continuance of a condensation of moistures and rain showers, at least well into the Summer, and thus keep up a continued growth of vegetation to a much later period in the season. All science and experience agree in the answer to this question.

Another consideration: The great scarcity of timber in our State is a serious drackback on her agricultural and mechanical prosperity; indeed, every industry suffers more or less from this scarcity, and as our population increases, the want of timber will be felt more and more. Yet, in a reckless and profligate manner we are cutting down our forests and substituting no new ones in their stead. To correct and check these growing evils, both as to climate and timber, something more than unaided individual effort is required.

If the Legislature were to pass some carefully matured and guarded law to give sanction, aid and direction to individual enterprise in the cultivation of forest and shade trees, it is believed that much substantial good would be the result, to say nothing of the inviting and life-like appearance that would be given to our whole country.

TEA CULTURE IN CALIFORNIA.

The sameness of production has been the curse of California agriculture. Our climate and soil and our interests continue in inviting a diversity of agricultural productions. As we have seen from year to year the list of our products increased and diversified in accordance with our recommendations and labor, and individuals and the commonwealth have grown richer and more independent, it has given us new courage to continue our work and to study up still more new articles and necessaries, for the production of which portions of our State are adapted.

The amount of tea consumed in the United States per annum is from forty to fifty millions of pounds.

Our importations for eighteen hundred and sixty-six, as shown by our commercial reports, were forty-two million nine hundred and seventy-eight thousand five hundred and sixty-seven pounds, and the cost at the ports from which it was imported was eleven million one hundred and sixteen thousand six hundred and twenty-three dollars. Add to this sum twenty-five per cent. impost duty and all expenses and profits before it reaches the consumers, and we shall find that the teas we drink annually cost us not less than thirty million dollars.

The tea plant flourishes best and produces the best tea in a high altitude on the sides of mountain ranges, say from three thousand to five thousand feet elevation.

Those persons who have been in the tea producing countries of China, of Upper Assam, and in the English possessions on the southern slope of the Himalaya Mountains and have seen the western slope of our Sierra Nevadas, are uniformly impressed with the similarity of the general

appearance of the climate and natural products of the soil. We have been struck with the uniformly expressed opinion of such persons that our Sierra Nevada foothills, at an elevation usually experiencing in the Winter season a fall of snow of from two to five feet, possesses all the requisites of a good tea country. We have also conversed with Chinamen from the tea districts of China, and we find their conclusions to be the same. One very intelligent one went so far as to say that if the State will give a bounty on tea he would prove that California was as good a tea country as China. Considering the annual cost of our teas, the circumstances above named and the fact that we have such a vast region of this description of country, valueless at present for any other known purpose, and that we have among us a large population, many of whom are acquainted with the business in all its details, we suggest whether it would not be well to hold out such encouragement as will induce the experiment of tea culture in California.

BEET SUGAR.

We have repeatedly called the attention of the public to the adaptability of the soil and climate of California to the production of sugar from beets. We have also, by showing them the amount and cost of our importations, and the cost at which beet sugar could be produced here, endeavored to point out the profits that must attend the successful prosecution of the business in our State, protected, as it would be, by a high import duty. We are happy to state that there are parties who understand the business in all its branches intending to enter largely into the business during the coming Summer, and give it a thorough, practical trial.

Any action of our General Government looking to the removal of impost duties on sugar from the Sandwich Islands would be seriously detrimental to this branch of agricultural industry in our State, and the whole influence of the Legislature should be brought to bear against any such action. The value of sugar and syrup imported into the United States for the year eighteen hundred and sixty-six, was forty-six million eight hundred and twenty-nine thousand five hundred and forty-three dollars. The duties on sugar range from three to five cents per pound, and on syrup from two and a half cents to eight cents per gallon. Let these duties remain, and if the enterprise referred to shall succeed, as we have no doubt it will, we shall be able in a few years to supply a large portion of this demand, and thus large sums of money which now go to foreign countries will be retained among our own people, and will enrich our own State.

SILK CULTURE AND MANUFACTURE.

The favorable climate of our State for the culture of silk and the liberal bounties offered by our last Legislature have given this industry such a start that with a continuance of encouragement it may soon

become one of the first, if not *the first*, industry among us. The establishment of a silk factory or factories to work up the raw silk produced is a matter of first importance. The reluctance with which capital in the State is invested where there is not a sure prospect of immediate and remunerative returns, is a serious drawback to the establishment of such factories, and is a strong argument in favor of special encouragement.

FULL TRANSACTIONS.

For a more full record of the transactions of the Society for the last two years, including the facts elicited, statistics collected and information gained on the subjects for which it exists, reference is made to papers accompanying this report. A full representation of the present condition of the various industries of the State, together with many suggestions valuable to those industries, will there be found. It is believed these papers will constitute a volume of transactions more interesting and valuable than any heretofore issued by the Society, and we recommend that ample provisions be made for printing a sufficient number for general circulation.

CHARLES F. REED, President.

I. N. Hoag, Secretary.

COMPILATION OF LAWS

RELATING TO, AND

CONSTITUTION

OF THE

STATE AGRICULTURAL SOCIETY.

A COMPILATION

OF ALL THE LAWS NOW IN FORCE RELATING TO OR AFFECTING THE STATE AGRICULTURAL SOCIETY.

AN ACT

TO INCORPORATE A STATE AGRICULTURAL SOCIETY AND APPROPRIATE MONEY FOR ITS SUPPORT.

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. There is hereby established and incorporated a society to be known and designated by the name and style of the "CALIFORNIA STATE AGRICULTURAL SOCIETY," and by that name and style shall have perpetual succession, and shall have power to contract and be contracted with, to sue and be sued, and shall have authority to have and use a common seal, to make, ordain and establish, and put in execution such by-laws, ordinances, rules and regulations as shall be necessary for the good government of said society, and the prudent and efficient management of its affairs; *provided*, that said laws, ordinances, rules and regulations shall not be contrary to any provision of this charter, nor the laws and Constitution of this State or of the United States.

SEC. 2. In addition to the powers above enumerated, the society shall, by its name aforesaid, have power to purchase and hold any quantity of land not exceeding four sections, and may sell and dispose of the same at pleasure. The said real estate shall be held by said society for the sole purpose of establishing a model experimental farm or farms, erecting inclosures, buildings and other improvements calculated and designed for the meeting of the society, and for an exhibition of the various breeds of horses, cattle, mules and other stock, and of agricultural, mechanical and domestic manufactures and productions, and for no other purposes.

And be it further enacted, That if, from any cause, said society shall ever be dissolved, or fail to meet within the period of two consecutive years, then the real estate held by it, together with all the buildings and appurtenances belonging to said estate, shall be sold as lands are now sold by execution, and the proceeds deposited in the State Treasury, subject to the control of the Legislature.

AN ACT

SUPPLEMENTAL TO AN ACT TO INCORPORATE A STATE AGRICULTURAL SOCIETY, APPROVED MAY THIRTEENTH, EIGHTEEN HUNDRED AND FIFTY-FOUR, AND AMENDED MARCH TWENTIETH, EIGHTEEN HUNDRED AND FIFTY-EIGHT.

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. The general prudential and financial affairs of the society shall be intrusted to a Board of Agriculture, to consist of a President and nine Directors, five of whom shall constitute a quorum.

[Amended section.]

SEC. 2. Said Board of Agriculture shall be elected at a general State Agricultural Convention, to be held at the Capital of the State, in the year one thousand eight hundred and sixty-three, in the month of March, and in the month of January every year thereafter, to consist of the life members and annual members of the State Agricultural Society and four delegates from each County Agricultural Society within this State incorporated under the general laws of this State for such corporations, and an equal number from each District Agricultural Society also incorporated under the general laws of this State for such purposes; said delegates to be chosen at the annual Fair or annual meeting of each such society next preceding the State Agricultural Convention; *provided*, said Convention to be held in March, in the year one thousand eight hundred and sixty-three, may admit any person or persons representing any of said County or District Agricultural Societies, as the Convention may determine by a majority vote, whether such persons shall have been elected by their respective County or District Societies, as provided in this Act, or not.

SEC. 3. The Board of Agriculture shall, at its first meeting after its election, be divided by lot into three equal portions (omitting the President), one portion to continue in office one year, one portion two years and one portion three years; one third of the number, together with the President, to be elected at the State Agricultural Convention annually thereafter; the Directors to hold office three years.

SEC. 4. The Board of Agriculture may, in the absence of the President, choose one of its other members temporary Chairman. They shall elect a Treasurer and Secretary, not members of the Board, prescribe their duties, fix their pay; and the said Treasurer and Secretary shall be subject to removal at any time by a majority of said Board.

SEC. 5. The Board of Agriculture shall use all suitable means to collect and diffuse all classes of information calculated to aid in the development of the agricultural, stock raising, mineral, mechanical and manufacturing resources of the State; shall hold an annual exhibition of the industry and products of the State; and, on or before the first day of January of each year in which the Legislature shall be in regular session, they shall furnish to the Governor a full and detailed account of all its transactions, including all the facts elicited, statistics collected and information gained on the subject for which it exists; and also a distinct financial account of all funds received, from whatever source, and of every expenditure, for whatever purpose, together with such suggestions

as experience and good policy shall dictate for the advancement of the best interests of the State; the said reports to be treated as other State documents are.

SEC. 6. The Board of Agriculture shall have power to appoint a suitable number of persons to act as Marshals, who shall be, from twelve o'clock, noon, of the day previous to the opening of the exhibition, until noon of the day after the close of the same, vested with all the powers and prerogatives with which Constables are invested, so far as acts or offences committed within or with reference to or in connection with the exhibition are concerned.

SEC. 7. The Board of Agriculture may, in its discretion, award premiums for the best cultivated farms, orchards, vineyards, gardens, etc., *provided*, that said Board shall not audit, allow, or pay an amount exceeding one thousand dollars in any one year for travelling expenses of Visiting Committees in examining said farms, et cetera; *provided* further, that no person except practical agriculturists shall be appointed on said committees.

SEC. 8. It shall be optional with any to whom a premium is awarded to receive the article named or its equivalent (as affixed) in coin.

SEC. 9. The State Agricultural Society shall have power, at its first annual meeting after the passage of this Act, to make such alterations in its Constitution as shall make it conform to the provisions of this Act.

SEC. 10. All Acts or provisions in conflict with the provisions of this Act are hereby repealed.

SEC. 11. This Act shall take effect from and after its passage.

CONSTITUTION.

OF THE CALIFORNIA STATE AGRICULTURAL SOCIETY.

ARTICLE I.—NAME.

SECTION 1. This society shall be called "The California State Agricultural Society."

ARTICLE II.—OBJECT.

SECTION 1. It shall be the object of this society to encourage the cultivation of the soil and the general development of all the agricultural resources of this State.

SEC. 2. To foster every branch of mechanical and household arts calculated to increase the happiness of home life.

SEC. 3. To extend and facilitate the various branches of mining and mining interests.

ARTICLE III.—MEMBERSHIP.

SECTION 1. *Annual Members.*—Any person who has, during the year eighteen hundred and sixty-five, or who shall, during this year or any subsequent one, pay into the funds of this society the sum of five dollars, may become a member of the same; such membership to expire on the thirty-first day of the following December.

SEC. 2. *Life Members*—Any person may become a member for life, by the payment of fifty dollars; or, if already a member, by the payment of forty dollars, and shall thereafter be exempt from all dues and assessments.

SEC. 3. *Honorary and Corresponding Members.*—Any person whom the Board shall propose may be elected an honorary or a corresponding member, and shall enjoy, free of charge, all the privileges of the society, except voting and holding office.

SEC. 4. *Privileges of Members.*—Any citizen of this State, being a member of this society, shall be eligible to office, entitled to vote, and enjoy the free use of the library, under the rules of the same, and have free admission, accompanied by the ladies and children of his family, to all the exhibitions of the society, and shall be permitted to compete for premiums in any or all departments.

SEC. 5. *Expulsion of Members.*—Any member who shall present for exhibition any article or animal which he is not entitled by the rules of the society to exhibit, or who shall attempt to deceive, or be guilty of a breach of good faith toward the society, may be expelled by a vote of two thirds of the members present at any meeting of the society; *provided*, always, that no member shall be expelled unless written notice of the alleged offence shall have been served on him, or left at his usual place of residence, at least twenty days previous to the action.

ARTICLE IV.—OFFICERS.

SECTION 1. The officers of this society shall consist of a President and nine Directors, who shall constitute a State Board of Agriculture, five of whom shall constitute a quorum. They shall elect a Treasurer and Secretary, not members of the Board. They may also appoint annually, as officers of the Board, a chemist, a botanist, a meteorologist, a geologist, a metallurgist, an ornithologist and an entomologist, and define the duties of each. They may appoint such committees on the various departments of agriculture, mining and manufactures, either generally or for specific purposes, as they may deem important for the best interests of the State, and require such committees to report the results of their investigations to the Board at such times as may be named by them.

SEC. 2. *Duties of President.*—The President shall preside at all meetings of the Board, and of the society; shall have power to call special meetings of the Board, when necessary, and at the written request of ten members, may call extra meetings of the society; shall appoint all meetings not otherwise provided for; shall vote only at the election of officers, and in case of a tie; and shall sign all financial and official documents emanating from the society not otherwise provided for. In the absence of the President from any meeting of the Board or society, any Director may be called to the chair, and during such meeting, and for the completion of any business transacted or ordered at the same, shall have the same powers as the President.

SEC. 3. *Duties of Secretary.*—The Secretary shall conduct the correspondence of the society, keeping in a separate book copies of all letters written in the name or on behalf of the society, holding the same free to the inspection of any member of the society, at any regular meeting of the same. He shall also receive and file all letters addressed to the society, holding the same subject to the Board of Directors. He shall attend all meetings of the society and the Board, keeping a full record of the doings of each in a separate book, and shall furnish a copy of the proceedings of each meeting to the Committee on Publication within five days after the close of such meeting. He shall prepare and publish all notices of meetings, shall keep a roll of all Standing Committees, and call the same (noticing absences) whenever desired to do so by the Chair; shall sign all certificates of honorary and corresponding memberships, and forward the same to those entitled to receive them. He shall keep, in a book prepared for that especial purpose, the name and address of every member; shall prepare and sign all gratuitous or complimentary cards or tickets of admission; shall countersign all diplomas, certificates of merit, etc., awarded by the society, and forward the same to their respective claimants. He shall be ex officio Librarian; shall keep the seal, and all the plates, dies, engravings, etc, belonging to the society, and shall cause to be struck therefrom such medals and impressions as may from time to time be required. He shall have charge of all specimens, models, plants,

seeds, books, etc., and arrange, prepare or distribute the same, under the direction of the Board. He shall prepare all reports to be made by the Board to the society, and all reports to be made by the society to the State. He shall receive all moneys due or payable to the society, and pay the same to the Treasurer, taking his receipt therefor; shall hold all bonds filed by officers of the society for the faithful performance of their duty, and all vouchers for every class of expenditure. He shall countersign all drafts ordered by the Board, and all certificates of annual and life membership, and keep an account of the same, in a separate book, as they are issued, and shall, in December of each year, prepare a tabular statement of the receipts and expenditures of the society, according to the law incorporating the same. For which services he shall receive such compensation as the Board shall decide to pay.

SEC. 4. *Duties of the Treasurer.*—The Treasurer shall receipt for all funds at the hands of the Secretary, and shall disburse the same only on the order of the Board, attested by the President and the Secretary. He shall also hold in trust all certificates of stock, bonds, notes, deeds, or other evidence of debt or possession, belonging to the society, and shall transfer, invest, or dispose of the same, only by direction of the society, or by a written order of the Board. He shall, within ten days after his election, file with the Secretary a bond for the faithful performance of his duties; said bond to be approved by the Board, and to be in a sum equal to twice the combined amounts of the funds on hand and the estimated revenue for the year, and shall, at the annual meeting, make to the society a detailed report of all his doings, for which services he shall receive such compensation as the Board shall, from time to time, decide to pay.

SEC. 5. *Duties of the Board.*—The Board of Managers shall have the general and financial management of all the affairs of the society in the interim of annual meetings. It shall fill all vacancies occurring between elections, and shall make the necessary preparations and arrangements for all meetings, Fairs, exhibitions, etc. The Board shall also have power to make its own by-laws (not inconsistent with this Constitution) and arrange the time and place of its own meeting.

ARTICLE V.—STANDING COMMITTEES.

SECTION 1. *Committee of Finance.*—The Committee of Finance shall consist of three (the President and Secretary being two), whose duty it shall be to audit the Treasurer's account, to examine and approve all bills before they are paid, to have a general supervision of the finances of the society, and to report their doings in full to the Board, whenever called on so to do.

SEC. 2. *Library Committee.*—The Library Committee shall consist of three (the Secretary being one) whose duty it shall be to have the general supervision of the library and cabinet, to make all necessary rules and regulations for the government of the same (said rules and regulations being subject to the approval of the Board), to suggest such means for the safe keeping and enlargement of both the library and cabinet as they may deem expedient, and to make a full report of their doings, together with the state of the department under their charge, at each annual meeting.

SEC. 3. *Visiting Committee.*—The Visiting Committee shall consist of three, whose duty it shall be to visit and examine all farms, orchards, vineyards, nurseries, field crops, mining claims, ditches, mills, etc., which

may be entered for competition, and which shall require examination at other times and places than the annual Fair; to award premiums for the same, according to the schedule, and recommend such gratuities as they may deem proper, and make a full report to the Board at least one day previous to the annual meeting.

SEC. 4. *Committee of Publication.*—The Committee of Publication shall consist of three (the President and Secretary being two), whose duty it shall be to contract for and superintend, under the direction of the Board, all printing and publishing necessary for the prosperity of the society.

ARTICLE VI.—DONATIONS AND BEQUESTS.

SECTION 1. All donations, bequests and legacies to this society, designated by the donors for any particular purpose embraced within the objects of the society, shall be with strict fidelity so applied; and the name of each donor, together with the amount and description of such donation, and the object for which it was designated, shall be registered in a book, kept expressly for that purpose.

ARTICLE VII.—MEETINGS AND EXHIBITIONS.

SECTION 1. *Exhibitions.*—The society shall hold an annual Fair and Cattle Show in the City of Sacramento, and may, at its discretion, hold such other exhibitions as it may deem conducive to the interests of agriculture.

SEC. 2. *Annual Meeting.*—The annual meeting shall be held at the Capital of the State, at such time, during the month of January in each year, as the Board may designate; at which time all the officers from whom reports of the preceding year's service are required shall present the same, and all officers for the ensuing year shall be elected by ballot; and all officers shall continue in office until their successors are duly qualified.

SEC. 3. *Special Meetings, how called.*—No special meeting of the society shall be called but upon thirty days notice in the columns of a newspaper published in each of the Cities of San Francisco, Sacramento, Marysville and Stockton; nor without a request signed by at least ten members.

SEC. 4. *Proxy Voting.*—It shall not be admissible for any member to vote by proxy in any meeting of this society, or its Board of Managers.

SEC. 5. *Quorum of the Society.*—At any meeting of this society, fifteen members (a majority of whom shall represent counties other than the one where the meeting shall be held) shall constitute a quorum.

ARTICLE IX.—OFFICE AND ROOMS.

SECTION 1. The office, rooms, library and cabinet of the society shall be permanently located at the Capital of the State.

ARTICLE X.—AMENDMENTS.

SECTION 1. Amendments to this Constitution must be presented in writing at an annual meeting, when, if unanimously agreed to, they shall be adopted; but if there be objection, and a majority consent thereto, they shall be spread upon the minutes and lie over until the next annual meeting, when they shall be read, and if, after due discussion, two thirds

of all the members present vote for the amendments, they shall be adopted and become a part and parcel of this Constitution.

ARTICLE XI.—EFFECT.

SECTION 1. This Constitution shall take effect from and after its passage.

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I certify the foregoing to be a true copy of the Constitution of the California State Agricultural Society, as amended by unanimous consent at the annual meeting of the society, held on the twenty-sixth day of January, A. D. eighteen hundred and sixty-five.

I. N. HOAG, Secretary.

TRANSACTIONS

OF THE

STATE AGRICULTURAL SOCIETY

FOR

THE YEAR 1866.

FOURTEENTH ANNUAL MEETING.

SACRAMENTO, January 29th, 1867.

The State Agricultural Society convened to-day at the Pavilion, corner of Sixth and M streets. The attendance was not large, the bad state of the roads in the interior preventing the attendance of many members. The meeting was called to order at three o'clock P. M.

The President (C. F. Reed, of Yolo)—Gentlemen: We have assembled in annual meeting to transact such business as may come before the Society, and also to render an account of our stewardship during the year just past. It will devolve upon you to elect a President for the year ensuing, and also to supply the places of three members of the Board of Directors whose terms of office have expired.

The Secretary read a communication from the San Joaquin Valley Agricultural Society, signed by the President and Secretary, certifying to the appointment of Edward M. Howison, J. Sarles, J. M. Davis and H. T. Compton as delegates to the annual meeting of the State Society; and also a proxy, authorizing the first named gentleman to act for the absentees.

On motion, E. M. Howison was authorized to act for the delegation from the San Joaquin Society.

The President—The first business in order now is the reading of the annual report of the Board of Directors. The Secretary will please read the report.

W. G. Morris, of Napa County—As the Hall is very cold, and the document appears to be very long, and it is probable that the Sacramento Union will, as usual, publish it in full, I move that the reading be dispensed with.

The motion was carried.

APPOINTMENT OF COMMITTEES.

C. Green, of Sacramento—I move that a Committee on Finance be appointed by the Chair, to consist of three members, to examine the accounts of the Secretary and Treasurer.

Agreed to, and the President appointed C. Green, C. S. Coffin and C. H. Ross.

The President—There are applications before the society from certain parties for premiums, and it will be necessary to appoint a Committee to consider their claims.

On motion, the President appointed F. W. Hatch, W. G. Morris and M. Sprague as the committee.

F. W. Hatch—There appears to be a strong disposition among members to get through the business to-day, and I move that a recess be taken to give the committees an opportunity to report.

C. Green—Is it necessary to receive the reports of committees before the election of officers?

The President—That is the usual custom.

A recess of half an hour was taken.

REPORTS OF COMMITTEES.

Upon reassembling, C. Green, from the Committee to examine the accounts and vouchers of the Secretary and Treasurer, reported that they had performed that duty and found them correct.

The report was adopted.

F. W. Hatch, from the Committee on Premiums, reported as follows:

"The Committee to whom was referred the application of Ezra M. Smith, for a premium 'for the best yield of grapes from not less than five thousand vines,' respectfully recommend that a premium be awarded to the applicant of twenty dollars. This vineyard is in El Dorado county—the yield being forty thousand pounds per acre.

"The Committee appointed to report upon the application of W. Fern for a special premium for the 'best yield of alfalfa on two acres of land,' respectfully recommend that a premium of fifteen dollars be awarded the applicant."

The President—You have heard the report. What action shall be taken?

J. F. Montgomery—I move that the report be adopted.

Several members suggested that the amount of grapes to the acre must have been overstated.

A member—Only two tons.

J. H. Carroll—Forty thousand pounds is twenty tons down at our place.

The President—The statement comes from good authority and has been sworn to.

The report of the Committee was adopted.

ELECTION OF OFFICERS.

The President—The next business in order is the election of a President for the ensuing year.

L. G. Butler—I nominate Charles F. Reed of Yolo.

It was moved and carried that the nominations be closed.

J. F. Montgomery—I move that the Secretary cast the vote of the society.

C. S. Coffin—The Constitution requires that the officers of the society be elected by ballot. I move that the Chair appoint tellers to collect and count the votes.

C. F. Reed—I had much rather some other man be selected to fill the office.

A member suggested that nominations were closed.

The Chair appointed C. S. Coffin and J. F. Montgomery as tellers.

A vote was taken and the Secretary announced that C. F. Reed, of Yolo, having received all the votes cast, was duly elected President for the coming year.

C. F. Reed—Gentlemen: I return you my thanks for this flattering mark of your appreciation of my efforts to fulfil the duties of the office of President. I shall continue in the future to endeavor to perform them in such a manner as will honor the society and be a credit to myself.

The President—The election of three Directors is the next business before the society.

E. I. Robinson—I nominate B. R. Crocker of Sacramento, T. L. Chamberlin of Placer and W. P. Coleman of Sacramento.

C. Green—I move that the nominations be closed.

A ballot was taken and the candidates named were unanimously re-elected members of the Board of Directors.

There being no further business before the society, at five o'clock P. M. the meeting adjourned *sine die.*

ANNUAL REPORT OF THE BOARD OF DIRECTORS

FOR 1866.

GENTLEMEN OF THE STATE AGRICULTURAL SOCIETY: One year ago, at our annual meeting, the Board, in their report to the members of this Society, used the following language:

"In closing these remarks we would congratulate the farmers of the State upon the prospect of a foreign market for their surplus grain, and on the very flattering prospects of a season of plenty and prosperity ahead. We hope these bright anticipations may be more than realized."

To-day we are happy to meet you in the fullest fruition of those hopes. The past has been a year of remarkable prosperity to California. Providence has smiled upon us, and every department of industry has more than realized its proudest anticipations of success.

Agriculture, upon which all other industries, the world over, depend for existence and prosperity, has in the year eighteen hundred and sixty-six, for the first time in California, been universally assigned that position to which its importance entitles it, and, as must ever be the case, it has imparted to other occupations a prosperity proportionate to that which itself has enjoyed.

We invite your attention to a brief review of the industrial occupations of our State during the past year, and of the results accomplished, so far as the imperfect means of gathering information enables us to present them. California farmers, until within a few years past, have not generally made up their minds to make their farms their homes and farming a permanent business. The uncertainty heretofore felt about the titles to their lands; the want of good roads, railroads, canals and other facilities for moving their crops; the lack of an adequate home market for their surplus products; the uncertainty of foreign demand, and the great distance between our ports and those countries likely to need our spare crops, added to the uncertainty, want of regularity and expense of transportation to those countries, have all combined in the past to exercise a depressing effect upon California agriculture.

Favorable Congressional legislation has opened the way to the just and certain settlement of our land titles. Capital and energy, assisted by

Governmental aid, is planning and actually building a network of railroads throughout our State. There is an increased confidence in the stability and permanency of our mines, as well as a great addition to the varied character and quantity of their products. Manufactories, for converting our raw materials into all the necessary articles used or consumed by civilized communities, are being established in different portions of our State. An increasing demand for commercial facilities on our coast is calling into existence frequent and permanent means of transportation between our ports and most other important States of the earth. While our agriculture stimulates and creates the necessity for all these enterprises, it is in turn stimulated and improved by them, and, as might be expected under the circumstances, we are enabled to show for the past year not only a greatly increased product, but a decided improvement in the management of our farms and in the tone and moral character of our agricultural communities.

WHEAT.

Our wheat crop for the last year is estimated, and, we think, within bounds, at twelve millions of bushels, and the quality is very superior. We have exported during the year to the Atlantic States, to Australia, Great Britain, China and other countries, three hundred and twenty-four thousand three hundred and fifty-three barrels of flour, and three million seven hundred and seventy-nine thousand eight hundred and eighty-eight bushels of wheat. But for want of sufficient tonnage to convey our breadstuffs away, our export figures would have been much larger. Nearly every available vessel now in port and to arrive is under charter to convey forward wheat waiting export, and our steamers by the way of the Isthmus go heavily loaded with flour for New York and other Eastern ports. Wheat and grains of all kinds in this State are almost wholly handled in the sack, and are generally exported in the same manner. This custom results in a serious loss to the producers—by some estimated at not less than two millions of dollars a year. We have frequently called attention to this subject and urged the greater economy of handling grain in bulk. In answer to inquiries, a large grain dealer and exporter in San Francisco writes as follows:

"My experience in shipping grain in bulk has been three cargoes to Australia, one to Hongkong and one to Liverpool. Those to Australia and Hongkong sold as well as in sacks. In Hongkong the tare of the sacks is deducted. The Liverpool shipment has not been heard from. I think the time is not far distant when grain will be handled in bulk here, as it is in the East, as it can be done for two-thirds less expense than in the way it is now being handled. I find no difficulty in getting vessels to carry grain in bulk. Our wheat sells at a higher figure in the English markets than any other, and having gained this reputation, it would be well to maintain it. The majority of our farmers are too much hurried in threshing. Many of the finest crops of wheat are materially lessened in value from this cause, much of the grain being broken, and an infusion of straw and seeds being mixed with it. This is more perceptible when

shipped or handled in bulk, and can be remedied by more care at the threshing machine."

BARLEY AND HOPS.

Barley is eminently our feed grain—with us, to a great extent, taking the place of corn. We have raised sufficient to supply a very large demand for home consumption—for feed and brewing—and have exported, mostly to Australia, seven hundred and forty-one thousand eight hundred and fifteen bushels; and have still on hand not less than forty thousand tons. It has been frequently asked what shall we do with our immense barley crops? In connection with this question we would state that the very large crops of hops raised by some of our farmers for the last year or two have most satisfactorily proven that we have a soil and climate not surpassed by any other country for the production of hops of the very best quality; that from the known great profitableness of the crop it is probable that within two years our supply will more than equal the demand. Again, we are annually importing millions of gallons of malt liquors, for which we are as steadily exporting thousands of our gold. Overburdened with barley and hops of the very best quality for brewing, we should not go abroad for our ales and porters. We should not only supply our own demand, but we should supply the wants of the entire coast. This being accomplished we could save England the trouble and expense of doubling Cape Horn or Cape of Good Hope to supply the immense quantities used by her colonies in the Indies, and make money by the operation. The State offers a liberal premium for the first ale exported and proved to stand sea voyages and changes of climate. He who will first take that premium may at the same time initiate a profitable business for himself and for the State.

WOOL.

Our wool clip this season has been equal in quantity to that of former years, and much superior in quality—the whole product being over seven millions of pounds. Of this amount some five million pounds were purchased for manufacture by two woolen mills in San Francisco and the balance exported for manufacture in the Eastern States. By another year one or two more mills will be in operation in the State, and there has lately started a factory for knitting socks, drawers and other knit goods. So that for eighteen hundred and sixty-seven it is hoped all the wool of the State will be needed for manufacture by our own mills, thus saving to our State millions of dollars now exported, and giving employment to a large number of operatives. These facts should encourage our wool-growers to increase and improve the product.

FRUIT.

The fruit product of our State is rapidly increasing. The quality cannot be excelled. With the help of Oregon, from present appearances, we shall be able to supply the demand for all the principal fruits on this coast the coming year. To show how rapidly we are decreasing the importations of fruits from the Atlantic States, we call attention to the amount of dried apples imported during each of the last three years. In eighteen hundred and sixty-four we imported one million five hundred and ninety-six thousand six hundred pounds; in eighteen hundred and sixty-five, six hundred and fifty-one thousand four hundred pounds; while in eighteen hundred and sixty-six the amount was reduced to five hundred and eighty-one thousand eight hundred pounds, thus showing that our product of dried apples alone was one million fourteen thousand eight hundred pounds more in eighteen hundred and sixty-six than in eighteen hundred and sixty-four, and by the increase of production of this one article we have saved among our orchardists the very considerable sum of one hundred and sixteen thousand six hundred and ninety-two dollars. The increase of other fruits, such as peaches, plums, apricots, etc., has been at least in proportion. As to canned fruits, the home product is already equal to the consumption, and this is very large. We are already producing a large quantity of oranges, lemons, limes and olives, and in a few years, with proper care and attention to this department of horticulture, will supply the entire home demand. Oranges grow and mature well in the open air in many localities, from the northern to the southern portion of the State. Some very fine samples were exhibited at our last State Fair, from Butte County, and our markets are now full of the delicious fruit from Los Angeles.

Our raisin crop is also increasing, one vineyard having put into the market the last year one thousand eight hundred boxes. There is no reason why, within two years, our market should not be fully supplied with a superior article, raised in this State. If our vine growers will turn their attention to this subject, and plant the proper varieties of grapes, we may profitably supply the entire demand of the Atlantic States, within five years from date, with an article superior to that they now import from abroad.

The same may be said in respect to figs, of which we produce as fine specimens, and in as great an abundance for the number of trees in bearing, as any other country. Our climate is also well adapted to the cultivation of the various nuts of commerce. The almond and English walnut are already produced in many parts of the State in considerable quantities, and in quality equal to the imported. Our peanut crop the last year was equal to our demand for consumption, estimated at two hundred tons. They are larger and better filled than any ever imported. It would pay to raise them, to export to the Eastern States, better than wheat.

WINE.

Our wine product for eighteen hundred and sixty-six is largely in excess of that of any previous year, being estimated at over two millions

of gallons. It is growing in favor wherever introduced. All we want now to make wine growing one of the most extensive and profitable industries of the State is the diffusion, among our people, of correct information upon the different branches of the subject and some effective means to prevent the sale, either at home or abroad, of an adulterated or spurious article. Our pure wines will recommend themselves wherever they may go, and if none but pure find their way into the markets we shall find ready sale for all we can produce for years to come, at remunerative prices.

One of the best indications for the success of the wine interest is the organization, recently, of a Wine Growers' Association for the State at large, with a determination to secure the objects above indicated. Through their Committees they are already at work gathering information, which they propose to publish and distribute among their members, and great good may be anticipated as the result of their labors. Large additions are being made to our present vineyards and many new ones are being planted this year, and it is hoped that, from the interest manifested in this branch of industry, we shall be able in a few years to produce all the varieties demanded for use at home, and keep pace with, what the times at present very plainly indicate, a steadily increasing demand for exportation. The vast region of country extending from the summit of the Sierra Nevadas to their western base, and stretching out the whole length of the State, is destined to become the most extensive and best wine growing country of the world, where millions of busy people will find happy and contented homes, clustered beneath their own "vines and fig trees."

OUR DAIRIES.

The dairy interest has not received that attention heretofore which its importance and its profits should have secured it. Most of the stock that was brought into the State in early days was imported by Western men, more for the purpose of supplying the great demand then existing for beef, than for purposes of the dairy. Having overstocked the country, they refused to sell at reduced prices, and the cattle of the State roamed over our vacant lands in large herds, of little benefit to their owners, and great detriment to the farmers. And although in eighteen hundred and sixty we possessed more milch cows in proportion to our population than any other State in the Union, yet for the six years ending in eighteen hundred and sixty-five we imported thirty-four million two hundred and twenty-six thousand six hundred pounds of butter, at a cost of nine million seven hundred and sixty-eight thousand three hundred and forty-six dollars in gold; or in other words, we exported annually one million six hundred and twenty-eight thousand and fifty-seven dollars in gold for our annual importations of butter. And during the three years ending the thirty-first of December, eighteen hundred and sixty-five, we imported one million three hundred and seventy-six thousand two hundred pounds of cheese, at a cost of two hundred and nine thousand three hundred and seventeen dollars, or an annual cost of sixty-nine thousand seven hundred and seventy-two dollars, making an annual drain on our gold product of one million six hundred and ninety-seven thousand eight hundred and twenty-eight dollars, which we sent forward

to the owners of Eastern dairies to pay them for the butter and cheese shipped to us, when at the time we owned more than twice as many cows in proportion to population as any one of the States from which we bought these articles.

We are happy to state that for eighteen hundred and sixty-six we have made a great change for the better. We have produced more cheese than we have needed for consumption, our estimated product being one million six hundred and ten thousand pounds, valued, at ruling prices, at two hundred thousand dollars. And while in eighteen hundred and sixty-five we imported six million eighty-two thousand eight hundred pounds of butter, at a cost of two million one hundred and twenty-eight thousand nine hundred and eighty dollars, in eighteen hundred and sixty-six we reduced that importation to four million two hundred and seventeen thousand one hundred pounds, which cost us one million four hundred and seventy-five thousand nine hundred and eighty-five dollars; thus showing that in eighteen hundred and sixty-six we made one million eight hundred and sixty-five thousand seven hundred pounds of butter more than in eighteen hundred and sixty-five, and thus saved to our dairymen and State six hundred and fifty-two thousand nine hundred and ninety-five dollars. Leaving out of consideration our receipts for cheese exported, and adding to this last sum ninety-seven thousand and fifty-three dollars, that we paid for cheese in eighteen hundred and sixty-five, and we have seven hundred and fifty thousand and forty-eight dollars as the increased value of our dairy product for the last year.

This Winter, so far, has been one of the most favorable for our pastures we have ever experienced, and we have but little hesitation in believing that for eighteen hundred and sixty-seven we shall be entirely independent of an Eastern supply, thus diverting so much of that stream of gold which for years past has so constantly flowed out at the Golden Gate, and turning it inland to enrich our own people and to stimulate the development of our own resources. The same amount of money we have sent for our butter and cheese during the last six years, if judiciously expended in the six to come, in the construction of canals and ditches for the irrigation of our plains, would make ours the richest agricultural State in the world, converting it into a land literally "flowing with milk and honey."

NEW PRODUCTS.

The limits of this report will not allow us to trace further the successes of our agricultural enterprises. The facts above stated with reference to particular products may be taken as a true index of our general progress. We feel it incumbent on us, however, to notice briefly the introduction into our State of some products comparatively new among us, and some of which are destined to add materially to our agricultural and manufacturing wealth.

We, as an agricultural people, are peculiarly situated. Being isolated by distance from the great producing centres of the world, as well as from its markets, it becomes peculiarly our interest to cultivate a variety of products, to supply, as far as possible, each and every want of all classes of consumers. To us, emphatically, a home market is the best market in the world. If the agriculturists of the Atlantic States, of

Europe, or of any other country, can produce an article and send it here for sale, paying freight and other charges, and make money, then certainly we can produce the same article and supply the demand for it, and make more money.

We once imported all our wheat and flour. We are now exporting these same articles to those countries on which we were then dependent, paying an extraordinary high freight on the same, and still making money by it. The same may be said of barley, oats, potatoes, wines, wool, and many other articles. Our ambition and our aim should be to increase this list, and decrease the list of our imports, gold being the only exception. A very good and safe rule for our farmers to adopt in determining what articles it will pay best to produce is to cultivate those which are most imported. If there is any doubt of your success in the production of any given new article, arising either from your want of familiarity with it or from climatic causes, then proceed with so much the more caution, and let your experiment be on a small and safe scale; but do not fail to make the experiment, for all cannot get rich raising wheat and barley.

TOBACCO.

The consumption of tobacco in this State, we all know, is very great, our importation averaging from four to five millions of pounds per annum, which, at an average of fifty cents a pound, costs us from two to two and a half millions of dollars a year in gold. Can we not produce this tobacco, and thus stop so much more of that stream of gold which is so constantly flowing away from us through the Golden Gate? This is a question for our farmers to determine, for they are immediately interested in its decision. The raising of tobacco in our State has been tried, and so far as its production went, it proved a splendid success. Old Virginia herself never saw finer fields of tobacco than have grown in California.

But at this point the success seems to have ended. Its curing and manufacture proved a failure. Those who raised it, as a general thing, were unacquainted with the business of handling and preparing it for market; and even those who did understand the business in the Southern and Western States found that the same mode of treatment they followed there would not do here, on account of the difference in the climate. As is too generally the case in our State, with persons engaging in new enterprises, those who attempted the business desired to make their fortunes before any one else could get into it and create competition; and hence they embarked too heavily in the first experiments; and, having failed in the realization of their extravagant and unreasonable hopes, they abandoned the business in disgust.

Does this prove that tobacco cannot be raised and manufactured in our State with success and profit? Not at all. The same difficulties were experienced by those who first attempted to cultivate and cure hops among us. The brewers were prejudiced against California hops, and refused to buy them when they could get others, alleging that the California hops were too rank and too bitter—that the liquor produced by their use was too strong and sharp. A little perseverance, care and study has overcome this difficulty, and hops, for the last two or three

years, have been the most profitable crop raised in the State, and, if well cured, are now preferred to the imported. That natural strength which they possessed, and which was retained by them in consequence of the dryness of our climate when growing, at first being considered an objection, is now their highest recommendation.

The objection to California tobacco arises from a similar cause; and we have no doubt but by the exercise of a little skill and patience an equal revolution may and will be brought about in regard to curing it and commanding for it a reputation. That has been done with respect to hops. California wines experienced a similar difficulty, and yet how gloriously have they triumphed! So will tobacco. Let experiments be continued, remembering that two millions of gold saved to the State every year, by checking its exportation for articles that we can produce, is worth more than an increase of ten millions dug from our mines and sent out of the State.

COTTON.

The history of the cultivation of cotton has also been an anomalous one in this State. Experiments on a small scale had been made for a number of years, in different sections, with gratifying success. Encouraged in part by these results, and in part by the very liberal bounty offered by the State for the first production in large quantities, several parties in the southern counties planted quite extensively in eighteen hundred and sixty-four. They all labored under adverse circumstances. Their seed was in great proportion of those varieties not adapted to our climate—being of the large, late varieties, and of a poor quality—rendering replanting to a great extent necessary. As the parties referred to were competitors for the State bounty on a hundred acres, they strained every nerve, but more to secure the number of acres specified to be planted than to insure a proper cultivation of the crop after it was planted. But, notwithstanding all these unfavorable circumstances, they all produced a more or less creditable crop; those portions of their fields which were planted with the Tennessee Upland and Pettel Gulf seed making excellent crops, both in respect to quantity and quality. One of the parties alluded to, in a letter to the Secretary of this Board, says:

"The sum of our experience may be considered to be:

"*First*—That the Pettel Gulf and the Tennessee may be considered the safest and most profitable, and should be planted as early as frost will allow.

"*Second*—That the low bottom and tule lands of the State are well adapted to the raising of cotton.

"*Third*—That, from the hardy nature of the plants, but little skill is required in irrigation, and that much less water is required than would be necessary in the successful cultivation of corn.

"*Fourth*—That the seasons in California are especially favorable to the production and the harvesting of cotton."

Another one of the parties writes:

"California ought to raise enough cotton to manufacture, not alone for

all her wants, but sufficient for the Pacific slope; and the time may arrive when California will rank, as a single State, the best cotton growing region in America. I can't see any difficulty in the way; it certainly will pay better than cereals. The price of cotton ought to be a fraction higher in California than in the European markets. The cost of planting and cultivating cotton is about the same as corn, only that corn requires about twice as much irrigation, or rain, as cotton. I paid from fifty to seventy-five cents per pound for my seed, and much was damaged by being taken out of a heated pile, or because it sweated in the hold of the ship that brought it, and made me much expense by replanting."

The latter party took the bounty of three thousand dollars offered by the State "for the first one hundred acres of cotton in bearing of good staple."

Thus far the history of our cotton culture looks well and encouraging, having proved beyond a doubt that with prudent management it may become one of our best and most profitable agricultural products. The cotton factory at Oakland prefers California raised cotton to that imported from the East, and yet, in the face of all these favorable facts, we have to record the strange truth that that same factory has been, during a good portion of eighteen hundred and sixty-five, and is now, importing raw cotton from New York to supply its wants for manufacturing cotton goods; that it is turning off about sixty thousand yards per month, all of which are made up into the single article of flour sacks, and this does not supply the demand for that article.

This fact has a significance in more ways than one. In the first place, it suggests the important question, why are not the farmers of California supplying the raw cotton for this factory? And in the next place, it suggests the immense quantities of cotton that would be used on this coast if raised and manufactured here in quantities to supply the demand; and, consequently, what an amount of our gold we export in exchange for cloth that we can and ought to raise and manufacture ourselves.

But to the explanation of the first inquiry. When our cotton crops of eighteen hundred and sixty-four were ready to be put into the market, the war had closed, and from various causes, not necessary to mention here, cotton fell in price all over the world. About that time our cotton factory, which alone could produce any demand for the raw material on this coast, was completed and ready to run, but did not feel disposed to pay more for cotton than it could be laid down here for from New York, and the exchange of money between San Francisco and New York favored the importer. Our producers had anticipated a high price, and would not sell for the price offered by the factory. Both the production and the manufactory being new enterprises, each felt entitled to a little favor and was in no condition to grant what itself was claiming. This state of things probably produced a little stubbornness on both sides, and the factory commenced the importing of raw cotton from New York at a considerably less figure than the California article was held at. These circumstances, combined with others at the critical time, operated against the continuance of the production by the same parties; and others, not understanding the cause of such discontinuance, have attributed it to a want of success in the production, and thus has resulted a general disinclination among our farmers to engage in the business, much to the detriment of their own interests.

This Society has on hand a large amount of good seed which they will distribute free to those who desire to plant it, and it is hoped the farmers

on our river bottoms will give the matter a careful consideration and fair trial; at least, throw a few bales of cotton in, to help dam the stream that is carrying so much gold from our mountains out through the Golden Gate.

SILK.

This Board has, in its reports and otherwise, for a number of years past, urged upon the people the opinion that we had the soil, climate and other circumstances necessary to render the culture of silk in our State a matter worthy at least of a general and careful trial. L. Prevost, of San José, having been engaged in experimenting with the different departments of the business for several years, is confident that we have one of the best countries in the world for its production—that in consequence of the favorableness of our climate during the Summer season, the absence of explosive electricity, of dampness either in the air or in the leaves used for food, very much less labor is required to attend the worms than in other countries where silk culture is prosecuted as a business. These circumstances, together with a mode of cultivating the mulberry trees and feeding the worms by cutting the branches back near the ground and placing them on the feed tables, instead of allowing the trees to grow high and picking the leaves one by one, as is done in most countries, we are satisfied are circumstances so much in our favor that they will enable us to compete with other countries where labor is much cheaper than it is with us. Adopting this view of the subject, our last Legislature very wisely passed an Act offering a liberal bounty for the production of mulberry trees and silk cocoons, to be continued a sufficient length of time to put the business beyond a peradventure and establish it as one of the successful industries of the State.

At our last Fair there were exhibited a large number of cocoons raised by some dozen different persons in various portions of the State, all of a very fine quality, and in connection with this fact we would state that in every case where experiments have been made under anything like favorable circumstances the worms have proved very strong and healthy, and nearly every one hatched has successfully spun a fine full sized cocoon. From the Japanese variety of worms in many instances two crops of cocoons were produced, one in June and July and the second in August and September. Prevost, as an experiment, was successful in producing three crops. Two may be depended upon as a certainty, giving the worms and trees proper attention and care.

We have no positive means of knowing how much silk California uses annually, or how much it costs to furnish it, but some idea may be formed in the premises when we state that the annual income to France from exports of her silk is said to be over seventy-eight million dollars, and that the United States contributes of this sum over twenty-two million dollars. California uses her full share of these imported goods, and contributes her share of gold to pay for them, besides importing a large amount from China and other countries.

I am happy to be able to record the fact that in view of these considerations, and encouraged by the liberal action of the Legislature and the success which has already attended the production of mulberry trees

and silk cocoons, gentlemen well acquainted with the silk manufacturing business have already purchased and imported all the necessary machinery for a very extensive factory, and are now engaged in putting the same up at San José, in this State. Thus we are already supplied with a home market for our cocoons, and it is hoped that our farmers will turn their attention to the supplying of that market, and not allow the manufacturers to import the raw material to keep their machinery running.

Let the business be taken hold of in a careful and safe manner, with no anticipation of making a fortune in a hurry. Begin by degrees, so as to learn by experience and incur no losses. The mulberry tree is one of the very easiest cultivated, growing as readily from the slip or cutting as the grapevine or willow, and on our rich bottom and tule lands throwing up a tree from the cutting in a single season to the height of from six to twelve feet. It is also easily cultivated from the seed, which can be obtained from our seed stores. If our people will judiciously enter into this business, it is believed that at no distant day California will not only supply her own people with home-raised and home-manufactured silks, but will be able also to secure a portion of that twenty-two million dollars which is now being contributed by the people of the United States in support of the silk industries of France.

BEET SUGAR.

In our last report to the Legislature, the Board discussed in full the sugar question and urged upon our agriculturists and capitalists the perfect feasibility of raising and manufacturing all our own sugar from the beet root at a much less expense than it costs us to import it. In view of the importance of the subject to the industry and economy of the State, we refer to the matter again. Very few people have any correct idea of the quantity of sugar consumed within our State or of the amount of money we pay for it. In the last four years we have imported from sugar-producing countries one hundred and twenty-seven million one hundred and thirty-nine thousand nine hundred and eighty-four pounds of sugar, or on an average thirty-one million seven hundred and eighty-four thousand nine hundred and ninety-six pounds per annum. This has cost us, at fifteen cents a pound—about the average paid for sugars—eighteen million eight hundred and seventy thousand nine hundred and eighty-seven dollars, or four million seven hundred and seventeen thousand seven hundred and forty-nine dollars per annum. Our molasses imported has cost one hundred and seventy-eight thousand and fifty-six dollars per annum, making the cost of sugar and molasses imported four million eight hundred and ninety-five thousand eight hundred and five dollars annually. A large portion of the sugar of the world is made from cane; but France, Germany, Austria and many other European countries have been engaged successfully in manufacturing just as good an article from the white sugar beet.

Of late years, some of the Western Atlantic States have also engaged in the business with success and profit. It is well known that from the rich alluvial soils of our river bottoms can be, and have been, produced some of the most astonishing crops of this root. As high as fifty tons

per acre is estimated by many of our farmers as an average crop, and none who have raised them extensively for feed for their stock placing the average at less than thirty tons—an actual experiment in one case showing a larger amount than either named.

Our beets, grown without rain, too, are much sweeter than those raised where they have frequent showers of rain while the beets are growing—in the latter case, more water and less saccharine matter entering into their composition. This difference is easily detected by the taste when cooked. It has also been proved by analysis and scientific experiment.

In view of the above facts we are happy to state that at San Francisco a gentleman of means and well acquainted with the business of making sugar in all its departments, from the beet root, has secured the necessary machinery for putting up a sugar factory, and will have all things ready for taking the beets that may be raised by our farmers this year and converting them into as fine a quality of sugar as any imported.

Then we would say to our farmers, raise beets. Here is another opportunity for checking that golden stream which has its source in our mountains, and, flowing out through the Golden Gate, is distributed over foreign countries, enriching their soil and invigorating their every industry. The man who, knowing that through a hole in his pocket he is constantly losing his money, and, with abundant time and means at hand, takes no steps to stop that hole and thus save his money, would be counted stupid and shiftless indeed. Now our State has many just such holes that need stopping, and until they are stopped she cannot grow rich; for, like the man with the hole in his pocket, it makes no difference how much gold he collects and puts into it, until he stops the hole so long will he be poor. So it makes no difference how much gold is dug from our mines; so long as that gold is sent out of the State, for whatever purpose, so long will our day of real prosperity be deferred. We must decrease our imports of the necessaries and luxuries of life, and in that same proportion will we decrease our exports of gold. We can only do this by a greater variety of products, judiciously selected.

WHAT SHALL WE RAISE?

Our farmers are constantly inquiring what they can raise to pay them for their labor and capital invested. We would say, raise such articles as your soil and the climate is best adapted to, and such as are most imported. In other words, stop the hole through which we are losing our money, dam the river which is carrying our gold away from us, and exercise your best judgment in selecting the means to do it with. You have already used wheat, oats and barley, until you find them floating rapidly along with the outgoing current; now throw in other articles liberally and you will find that each will help the other, and you will the sooner produce the effect desired.

We would suggest the trial of tobacco, cotton, silk, sugar, butter, wine, raisins, figs, castor beans, flax, rice, oranges, lemons, English walnuts, almonds, and many other articles which to the extent they have been tried have been found to work well. But let no one try to throw in too much of any one article at a time, for if by accident it be carried away, the loss may be too great for him to bear, and it may retard the

general success. Large streams cannot be stopped at once, and care and skill are required in selecting and placing the material used.

MANUFACTORIES.

If space would permit we would review with some particularity the various manufacturing interests and manufactories of the State, as they contribute very materially to the prosperity we enjoy. No community can become wealthy and independent which depends alone upon the production of the raw material. There is no great staple article produced in any one country that is not or cannot be produced in some other. To be truly prosperous and independent every State, particularly California, situated as she is, should do as near as possible all her manufacturing. She should feed, from her own productions, all her own people, make all their clothing, and furnish them all the machinery, implements and tools they use, and all other necessaries of life. When we can do this the richness of our mines will not be judged of by the amount of gold we export, but rather by the correct standard—the amount they produce and the healthy and prosperous condition of all our industrial pursuits. Just in proportion to the amount of gold we export in exchange for articles we can and ought to produce, and manufacture or labor we ought to perform, just in that proportion do we enrich other countries and impoverish ourselves.

The rapidity with which new manufacturing establishments of various kinds are being introduced and put into operation among us, show that our men of enterprise and means are beginning to appreciate these propositions, as well as the prospects of a handsome return for their investments. We know of no manufacturing interest in the State that is not in a most prosperous condition. We know of not one that is not pushed to supply the demand for its articles and at a fair paying price. We need more woolen mills, more flour mills, more foundries and machine shops, more tanneries, more powder and shot factories, more paper mills, more manufactories of boots and shoes and socks; of harness and saddles, wagons and carriages; of furniture and wooden ware; of glass and earthen ware; of agricultural implements and mining tools; and hope we will soon need more silk, cotton and sugar factories. And only when we manufacture all the necessaries of life which we now import will our wants in these respects be fully supplied.

MINING.

If we leave the agricultural and manufacturing industries and take a glance at the mines of our State, we find that here also an unusual degree of prosperity has for the last year been the reward of labor and the judicious investment of capital. Upon the discovery of the mines in California, the American people were almost entirely unacquainted with the business of mining in any of its departments. The anxiety to accumu-

late fortunes in a hurry and return to their homes and friends to enjoy their gains did not lead them to exercise the best judgment, or to adopt the most economical and approved modes for the development of our mines, but rather to skim the surface for that which could be obtained with the least labor and expense. The country, by them, was regarded as of no value for any other purpose but for its mines. To make a home in it did not in the least enter into their calculations. Hence the miners, as a class, became, in an early day, nomadic and migratory—floating here and there wherever report made the mines appear the most favorable.

But since agriculture has been so favorably developed, not only in our valleys and plains, but even in the foothills and mountains surrounding our best mines, a change has come over the minds of the people and all their prospects and hopes have taken a new direction; all that was at first transient and uncertain is becoming permanent and substantial. A more close and thorough system of prospecting and working has shown that our most valuable and remunerative mines lie deep in our gravel and cement beds and permeate our countless quartz ledges. Hence many of the once deserted mining localities of our State are being reoccupied and opened up, and labor and capital are uniting in making permanent improvements, indicating a confidence in our mines heretofore unknown. In place of the canvas tent and brush house, standing vacant during the day and occupied by cheerless miners at night, we now behold the neat cottage and outbuildings, surrounded by a variety of fruit trees and vines and occupied by happy and prosperous families.

Where once a small collection of tents and cabins constituted mining camps of a few hundred men, we now may see prosperous cities containing a population of thousands of people of all ages, fine residences, schoolhouses, churches and other public buildings, foundries, machine shops, quartz mills and other evidences of permanence and prosperity. The fact that the product of the mines of the coast has been greater during the year eighteen hundred and sixty-six than any previous year proves their inexhaustible character. During no previous year has so much Eastern and foreign capital been invested in our mining districts, and never before have such investments proved so uniformly judicious and remunerative.

It was formerly supposed that our mines of value were confined mostly to the precious metals; but for years past we have been discovering other minerals of more or less value in every department of the industries of civilization. We have, in inexhaustible quatities, coal, copper, quicksilver, sulphur, borax, manganese, lead, plumbago, nitre, iron in great variety, marble of the best quality, slates, various kinds of valuable clays, and nearly all other mineral substances known to science or used in manufacturing or the arts. Indeed, it is generally admitted that no other equal space of the earth's surface embraces so great a variety of agricultural and mineral resources as that contained within the boundaries of our State.

And here we will venture the assertion that no community of equal numbers in the world has, during the past year, produced so great a quantity of agricultural and mineral products, or a quantity of greater value, than the people of California. A comparison in this respect of some of our crops with those of other States may be instructive. Illinois is the greatest grain-growing State in the Union, and in this respect is almost the wonder of the world; yet in eighteen hundred and sixty Illinois produced only fourteen bushels of wheat to each of her inhabi-

tants, while in eighteen hundred and sixty-six California produced twenty-seven bushels. Ohio is the largest producer of wool; yet in eighteen hundred and sixty she only produced a very small fraction over four and a tenth pounds to each of her inhabitants, while in eighteen hundred and sixty-six California produced fifteen and one fourth pounds. In eighteen hundred and sixty Ohio produced more wine than any other State in the Union; yet her wine product for that year was not quite one fourth of a gallon to each of her inhabitants, while in California the last year the product is over four and a half gallons to the person. And so we might go on through the list of agricultural products; but to prove our proposition we need only refer to the product of our mines, which of itself is over one hundred dollars to each inhabitant.

IRRIGATION.

We have frequently called the attention of the farmers to the great benefits to be derived from a proper irrigation of their lands, particularly the grain lands back from the river bottoms, and have pointed out portions of the State where large tracts of land now of but little value could be irrigated and rendered very valuable by the introduction of water from our main rivers. Impressed with the importance of this subject, and acting upon the facts and suggestions presented to them through this source, our last Legislature made an appropriation to pay the expense of the survey for a canal, tapping the Sacramento River about the northern boundaries of Colusa County, and conducting the water through the Counties of Colusa, Yolo and Solano into the Suisun Bay, to be used for irrigation and for freighting. That survey has been made during the past Summer, and from William H. Bryan, the engineer of the work, we have received the following letter in answer to a request for information:

"San Francisco, January 24th, 1867.

"*I. N. Hoag, Secretary, etc:*

"Dear Sir: I have received your letter asking for some information upon the subject of the survey of the Sacramento Irrigation and Navigation Canal. I have been in hopes of closing up the estimates and report on the survey by or before the end of the month. I will then be at your service to extract from it whatever you may think will best answer your purpose. In the meantime, I may say that from the survey we find:

"*First*—That an area of land exceeding three quarters of a million of acres—generally of great natural fertility, but high, and in ordinary seasons too dry for agriculture without irrigation, and of little value without it—may be watered by a canal built upon or near the line of survey. Also, that the lands are very favorable in location and in their figure for the easy and cheap application of water to them.

"*Second*—That, in my opinion, a canal of sufficient capacity to irrigate the lands in question, and at the same time afford a good line of inland transportation and great water power with adequate supply of water, is practicable. Further, that the benefits resulting from the use of the canal will be found more than an equivalent for the necessary outlay in its construction.

"*Third*—That with the canal the capacity of the irrigated region for production will be multiplied manifold, and its marketable and taxable value in the same proportion. It will be rendered capable of supporting a population approaching one to each acre, with double, or more than that, number of domestic animals—a condition now existing in some irrigated districts in Europe and Asia of less natural advantages of soil and climate than the valley of the Sacramento."

We would state that our Representative, John Bidwell, has introduced a bill in Congress in aid of the above enterprise, and it is hoped it may become a law, that this immense benefit may be realized to our State, and that the reclamation of our dry lands may form a part of a system for the reclamation of our wet lands—the one materially aiding the other. Various projects for irrigating other portions of the State are being discussed, and an organization of capitalists has been made, the object of which is to irrigate the very rich but dry country extending from the San Joaquin to the Tulare Valley, embracing thousands of acres of land now of but little value, but when irrigated rendered immensely rich and valuable.

SUMMER FALLOWING AND DRY SOWING.

Those farmers who have practiced Summer fallowing in this State have scarcely ever failed to produce a good crop of grain in our dryest of seasons, and the strongest of arguments in favor of this system of putting in grain heretofore has been this fact. When grain is sown before the rains begin to fall, the ground being warm and mellow, it sprouts quickly as soon as the ground is sufficiently damp, and has abundant time, before the temperature of the weather becomes so low as to check its growth, to throw down a root deep and become strong and vigorous. When Spring comes it spreads out rapidly, throws up its stalks and matures before the drouth can affect it. The next reason in favor of Summer fallowing is that by this system the farmer can manage to put in a great deal more land with less help, and it gives him time to do his work well, and he need never fail to put in as much land as he has set apart for that purpose. While, if he waits till the ground is sufficiently wet to plow before he commences to prepare it for his seed, he often is compelled to hurry up his business and is very likely to slight it, and consequently he reaps but a poor crop.

The present season is rather an exceptional one, it is true, but it furnishes a very strong argument in favor of adopting the Summer fallowing system for wet seasons, as well as dry. Those who had their ground fallowed were able to sow their seed before the rain commenced, and it has made a vigorous growth and bids well. While, in consequence of the lateness in the season of the commencement of the rain, and its long continuance, keeping the ground too wet to plow soon, very much of our grain cannot be put in until very late in the season, and for want of time the amount sown will probably fall very much short of what the farmers intended to plant. Under such circumstances, it will probably be better to sow what can be done in time, and done well, and occupy the balance of the time in the Spring months in Summer fallowing for the coming season. In this way, perhaps, this long continued wet weather

may be an inducement for the more general adoption of a better system of putting in grain. Then, again, as some grain crops must necessarily be late sown, it may be a good opportunity to commence the cultivation of other varieties of crops, such as have been suggested.

AGRICULTURAL EDUCATION AND THE PRESS.

Among the new ideas of the age is the one that he who is to be an agriculturist, like the lawyer, the doctor, and men of other learned professions, should be educated with particular reference to his future calling—that to be a successful and useful farmer, a man should know not only how to do all that may be required to be done on the farm, but he should be able to give a good and true reason for all he does; in short, that he should be an intelligent master of his business in all its bearings. Hence the establishment of agricultural colleges and experimental farms, and the agitation of the introduction of agricultural studies into our common schools; hence the establishment of agricultural papers and the general increasing interest in agricultural pursuits.

Our schools are intended for the education of the young—for instilling into the minds of the youth principles and habits of study and research, which they are to carry with them into all the various walks of busy life. But the great institution of the age for the diffusion of general knowledge—the great, effectual and constant teacher of mankind, from early manhood to old age, in all the occupations of life—is the Press.

We have our political, our religious, commercial, scientific and agricultural papers, each devoted to its particular specialty, and endeavoring to cater to the wants of the particular class of people for whose especial benefit it is published. But a journal that aspires to be instructive and interesting to all classes of people must assume a general character. It must collect and diffuse information on all subjects, endeavoring to give to each industry that attention which its relative position and importance demands. These things no press in the world understands better than the press of California. Our people are practical and cosmopolitan in character, and so are our general newspapers.

The local papers of an agricultural county can be a greater benefit to themselves and their readers, and obtain a greater number of them, by devoting a considerable space to agricultural subjects, and collecting and diffusing local agricultural facts and successes, than in any other way. The same may be said in regard to the local papers in the mining districts, and their connection with the mining interests. But a paper of general circulation must adapt itself to the general reader as well as to large classes of special readers. In our Eastern cities, some of the great daily journals, in accordance with the spirit of the age and the growing prominence of agricultural interests and increasing desire for agricultural information, regularly devote a certain portion of their space to agricultural subjects—thus forming and supporting in their journals a regular agricultural department. To keep up this department with the improvements and requirements of the agricultural interests of the country, they employ an agricultural editor, whose whole time is devoted to this department. In this way, without any additional expense, the farmers enjoy the benefits of a daily agricultural journal in connection

with the same paper which brings them the general news. Thus a great good is being accomplished, and agricultural knowledge and education is being advanced more rapidly than it could be by any other system of journalism. It is hoped that some of our enterprising dailies in this State will adopt this plan. It is believed our farmers would hail with joy such an undertaking, and would give it a hearty and paying support. In connection with this subject, the Board would express their sincere thanks to the press of the State for the lively interest they manifest in the prosperity of the society, and the valuable assistance they so freely render them in their efforts for the development of all our material industries and resources.

THE SOCIETY.

The whole receipts of the society since our last annual report, including two hundred and fifty-six dollars and thirty-five cents on hand at that time, have been twenty thousand, three hundred and sixty-one dollars and eighty-five cents, and the whole disbursements for the same period, nineteen thousand, six hundred and thirty-nine dollars and ninety-six cents, leaving now in the Treasury seven hundred and twenty-one dollars and eighty-nine cents. Of the old indebtedness there has been cancelled three thousand six hundred and ninety-three dollars and forty-four cents, leaving now outstanding as the entire indebtedness of the society, including interest to date, three thousand eight hundered and fifty-one dollars and thirty cents. On the first of July next the State appropriation of four thousand dollars will be due the society. The stock ground and track is rented for a hundred and twenty-five dollars per month until January first, eighteen hundred and sixty-eight. So it will be seen that financially the society is in a better condition than it has ever been since the first year of its organization. It has been a slave; it is now free. The present officers saw plainly, when they assumed the management of its affairs in eighteen hundred and sixty-three, that the society could not be of much benefit in the development of the State's resources while incumbered with an indebtedness of over twenty-six thousand dollars hanging over its head, held in small sums by some hundreds of creditors, each one standing ready to attach the first money or property belonging to the society that could be found.

Such was the unfavorable condition a little over three years since. Since that time its management has always been directed with an eye, first, to the payment of the debt, and incidentally, but certainly and surely, to do what could be done under the circumstances for the permanent advancement of the best interests of all the varied industries of the State. Having so nearly accomplished the first object that they have secured the certain means for its completion, the Board now announce that hereafter the management will always be directed with an eye, first, to the healthy development of our resources and the encouragement of all our industrial pursuits, and incidentally, but certainly and surely, to keep out of debt.

Our premium list for eighteen hundred and sixty-seven will be published and distributed as soon as it can be printed. It will embrace liberal premiums for the encouragement of all our industrial occupations,

agricultural, mechanical and mining. The officers will persevere in the efforts lately inaugurated for the collection and diffusion of agricultural and other material information through the medium of auxiliary societies and the press, and will institute other methods of improvement for the general good. They will here remark that through the press, and through private letters received from enterprising farmers in many of the counties, they are induced to believe that the people generally will second their efforts in whatever improvements they may see fit to initiate, and, if so properly supported and aided, there shall be no lack of effort on our part to make the State Agricultural Society what it has always been our ambition and desire to make it—the acknowledged medium for the diffusion of useful and practical knowledge among our own people and a true index and exponent to other States and peoples of our unequaled resources and real prosperity.

MEETING OF THE BOARD OF AGRICULTURE.

At the call of the President the Board met January thirtieth, eighteen hundred and sixty-seven, at eleven o'clock A. M. Present—C. F. Reed, President; Directors Beck, Coleman, Chamberlain and Wheeler.

The time for the next State Fair was fixed to commence on Monday, the ninth of September, and continue six days. The President and Secretary were appointed a Committee to revise the Premium List for immediate publication.

The Secretary read a proposition of W. L. Allison & Co., publishers of the Working Farmer, of New York, in which, "for the purpose of promoting the practice of Farm Bookkeeping, they offer a premium of two hundred dollars for the best Farm Record in the United States for eighteen hundred and sixty-seven—the award to be made by the American Institute Farmers' Club; and also a premium of ten dollars for the best Farm Record in each State for eighteen hundred and sixty-seven, provided that the State Agricultural Society will offer a like sum." The Board decided to accept both propositions, only that instead of ten they would add forty dollars for the best Farm Record in this State for eighteen hundred and sixty-seven—making the premium fifty dollars. These records to be handed to the Secretary of this Society in January, eighteen hundred and sixty-eight, to be judged of at the annual meeting of that year—the successful one here to go forward to the Farmers' Club in New York, to compete there for the National Premium of two hundred dollars.

The Secretary also read a communication from a committee of the Sacramento Light Artillery, stating that the company had deposited one hundred dollars with D. O. Mills & Co., of Sacramento, as a contribution to a prize to be shot for by the artillery companies of the State who should deposit a like sum with the same firm for the same purpose, and asking the Board to arrange for such shooting to take place under the auspices of the State Agricultural Society at their next annual Fair. The proposition was accepted, and Directors Beck, Coleman and Mills were appointed a Committee to make the necessary arrangements.

The present incumbents, I. N. Hoag, Secretary, and R. T. Brown, Treasurer, were unanimouly re-elected to the same positions.

Coleman and Hoag were appointed a Committee to have made a lot of show-cases for the exhibition of fine goods at the next Fair.

STANDING COMMITTEES.

The following Standing Committees were appointed:

On Finance—The President, Secretary and Wheeler.
On Library—Carroll, Crocker and Hoag.
On Publication—President, Secretary and Coleman.
Visiting Committee—Chamberlain, Woodward and Richardson.

The Board decided to appoint co-operative committees in the different branches of industry, to assist in getting up a good representation at the next Fair of all those branches; a committee of mechanics for the mechanical department, of farmers for agricultural products, etc., all of whom will be announced as soon as selected. The Secretary was instructed to urge the farmers, by correspondence and otherwise, to organize county societies throughout the State in accordance with the circular recently issued, and to notify all existing societies of the time of the State Fair.

THE LATE WILSON FLINT.

The Secretary stated that since the last meeting of this Board, the State Society had been deprived by death of one of its most useful members in the person of the late Wilson Flint, and that in the absence of any action by the annual meeting, he deemed it meet and proper that this Board, as the representative of the agriculturists of the State, should take some action and express their sorrow and respect for the loss the farmers have sustained in his death. He would therefore offer the following as the sense of this Board:

Resolved, That in the death of the late Wilson Flint the State Agricultural Society and the interests of agriculture of California have lost a most devoted and useful friend, a most intelligent and successful advocate. He was a most close observer and constant and correct thinker. He traced the eternal laws of nature through cause to effect and through effect to cause. He was one of the first to see the peculiar advantages offered by California in consequence of her favorable soil and climate for agricultural pursuits. He illustrated his faith in the success of new and valuable agricultural products by engaging personally in their cultivation, as well as by well conceived and well written essays for the instruction and encouragement of his fellow farmers. His name is inseperably connected with the success of our horticulture, fruit culture, wine culture, and, up to the very day of his death, he was firmly resolved to make California one of the finest silk-producing States in the world; and to contribute to such a result he had resolved to be himself the most extensive silk producer and manufacturer in the State, and had his plans all made and was engaged in their execution. The death of such a man in such a State is a loss indeed. Though we lament his loss, we may emulate his life and his example. Though none of us can supply his place, we may all be more useful to our fellows and our State, by his having lived. Our most profound sympathy is extended to the bereaved family.

The memorial was unanimously adopted and ordered to be spread upon the minutes of the Board, and a copy furnished the family of the deceased.

The Board adjourned to the call of the President.

FINANCIAL REPORT OF THE SECRETARY.

Date.	On what account.	Amount.
1866.	RECEIPTS.	
January 1..	Cash on hand	$256 35
"	Rent of Park	300 00
January 8..	Cash of W. H. Thomas, for frame	3 50
Jan. 31.....	For memberships	320 00
March 9....	Rent of Park	300 00
August 27..	Cash of Bowles & Chase	450 00
Sept. 10....	Entries for races	255 00
"	Sale of tickets	2,864 75
Sept. 11....	Entries for races	365 00
"	Sale of tickets	1,914 00
Sept. 12....	Entries for races	235 00
"	Sale of tickets	2,004 50
Sept. 13....	Entries to races	225 00
"	Sale of tickets	2,097 00
Sept. 14....	Entries for races	440 00
"	Sale of tickets	1,416 50
Sept. 15....	Entries for races and sweepstakes	253 75
"	Sale of tickets	1,321 50
Sept. 25....	Rent of Park six months	600 00
Sept. 26....	State appropriation	4,000 00
Nov. 23.....	Cash for old lumber	40 00
"	Cash for bar, brick wall, etc	225 00
1867.		
Jan. 15.....	Rent of Park to April, 1867	475 00
	Whole receipts to date (paid Treasurer)	$20,361 85
1866.	EXPENDITURES.	
Jan. 12.....	Paid M. S. Taylor, filling diplomas	$13 50
Jan. 17.....	Edwards & Co., stationery	9 25
Jan. 22.....	George H. Vose, for wood	10 00

Date.	On what account.	Amount.
February 3	C. P. Duane, damage to picture	$100 00
February 5	D. O. Mills & Co., legal tenders for Post Office stamps	10 00
February 6	I. N. Hoag, salary, etc	153 00
Feb. 14	E. M. Skaggs, use horse and buggy	10 00
"	H. S. Crocker, for printing	3 00
March 10	Daniel Flint, premium on hops	25 00
March 13	T. C. Birney, premium on report	25 00
"	W. P. McGarvey, premium on report	50 00
"	I. N. Hoag, salary, etc	161 50
"	C. Iser, balance on premium	1 75
"	J. N. Andrews, engraving	2 00
March 23	M. S. Taylor, filling diplomas	5 50
April 22	D. O. Mills & Co., legal tenders for Post Office stamps	15 00
April 27	Massol & Merwin, for wrapping paper	1 50
"	I. N. Hoag, salary for March and April	300 00
"	F. Foster, binding books	250 00
June 14	Russell & Winterburn, printing	108 00
July 10	H. S. Crocker, printing	75 00
Sept. 12	Chase & Boruck, advertising	50 00
Sept. 18	T. J. McKim, engineer	185 20
"	John Nickerson, labor	24 00
Sept. 24	Miller & Glascock, horse hire	48 00
"	Peter Humrich, hack hire	2 50
"	William Sutton, police at Park	24 00
"	P. M. Chapman, horse hire for Marshal	60 00
"	N. A. Goodale, carpenter at Park	26 62
"	W. Schacht, sprinkling street	13 50
"	D. H. Norris, night watch at Hall	12 00
"	Justin Gates & Bros., sundries	5 12
"	C. H. Shear, whitewashing Park fence	40 00
"	Fitzsimmons, gas-fitting at Hall	56 25
"	I. L. Merrell, lights at Hall	30 00
"	Joseph W. Taylor, police at Park	24 00
"	Y. W. Gunn, carpenter at Hall	94 00
"	George Schmeiser, work on engine	75 00
"	Edwards & Co., stationery	27 00
"	M. & W. Wilcox, pumping at Park	50 00
"	Thomas Hansbrow, for stovepipe	6 50
"	W. H. Sinclair, labor at Hall	15 00
"	H. Clock, cleaning up Hall	9 00
"	Thomas Byrnes, cleaning up Hall	9 00
"	E. M. Frey, horse hire	30 00
"	Gas Company, for gas	108 00
"	I. N. Hoag, salary	750 00
"	Locke & Lavenson, sundries	39 57
"	W. Frazer, use of lumber	123 03
"	N. L. Drew & Co., use of lumber	171 47
"	Daily Record, advertising	20 00
Sept. 25	J. B. Gallar, purse won by Latham	400 00

Date.	On what account.	Amount.
Sept. 25....	B. Rice, purse won by Young America.....	$250 00
"	Thomas White, purse won by Pilot.....	400 00
"	R. T. O'Hanlon, purse won by Deringer.....	250 00
"	A. Musick, purse won by Helen Moore	200 00
"	J. B. Gallar, purse won by May Queen.....	400 00
"	W. Porter, purse won by Fillmore.....	400 00
"	Harris Covey, purse won by Maid.....	150 00
"	A. M. Stevenson, purse won by Shiloh.....	400 00
"	C. D. Lusk, purse won by Pat. McCune.....	250 00
"	Pat. Farrell, purse won by Sorrel Charley and Lady Clinton.....	500 00
"	Pat. Farrell, purse won by Grandee.....	250 00
"	E. M. Skaggs, purse won by Dick Gough.....	500 00
"	Thomas White, purse won by Pilot	500 00
"	W. H. Tisdale, purse won by Jim Hawkins.....	300 00
	PREMIUMS PAID AT THE PARK BY THE TREASURER UPON ORDER OF THE PRESIDENT AND IN ACCORDANCE WITH THE AWARDS OF COMMITTEES:	
Sept. 15....	A. J. Rhoads, for General Taylor.....	40 00
"	Henry Hyser, for Henry St. Clair.....	20 00
"	Edward St. Louis, for Young Black Eagle.....	30 00
"	George W. Jacobs, for John Conness.....	30 00
"	A. F. Smith, for Bell.....	30 00
"	Michael Ryan, for Fanny Dooley.....	20 00
"	C. H. Hoffman, for Seward and Lincoln.....	40 00
"	Edward Purdy, for Beck and Vie.....	40 00
"	William K. Squires, for Mac.....	15 00
"	A. M. Stevenson, for Shiloh.....	50 00
"	A. M. Stevenson, for Triune.....	30 00
"	John Hall, for Jonathan.....	20 00
"	L. P. Marshall, for Ellen Jordon and colt.....	50 00
"	John Hall, for Peggy Ringgold.....	40 00
"	Abraham Musick, for Ellen Moore.....	25 00
"	A. M. Stevenson, for Fanny Harper.....	50 00
"	J. G. McCracken, for David Hill and ten colts.....	75 00
"	C. H. Shear, for Peggy Magee and five colts.....	40 00
"	J. G. McCracken, for David Hill.....	40 00
"	J. G. McCracken, for David Hill, Jr.....	20 00
"	J. G. McCracken, for Comet.....	15 00
"	Francis Graham, for Dolly and colt.....	40 00
"	Edward Fouke, for Mary Blane.....	30 00
"	G. L. Clark, for Maggie.....	20 00
"	J. G. McCracken, for Mary Ann.....	15 00
"	J. G. McCracken, for Victoria Runyon.....	10 00
"	H. W. Seales, for Iron Duke.....	30 00
"	John S. Wilson, for Highland Chief.....	15 00
"	Wm. C. Meyer, for Cascades.....	10 00
"	A. H. Cheeney, for Betsy.....	30 00
"	George Linn, for Nelly.....	25 00

Date.	On what account.	Amount.
Sept. 15....	A. T. Leachman, for Lexington	$40 00
"	W. W. Burdell, for Stonewall Jackson	30 00
"	A. T. Leachman, for General Grant	20 00
"	A. Parker, for Paul Jones	15 00
"	Joseph Bauquier, for Kate and colt	40 00
"	J. D. Barbee, for Sue Nelson	20 00
"	J. S. Barnes, for Nettie Moore	15 00
"	Sullivan Treat, for Comet	30 00
"	C. H. Shear, for Camp Union	20 00
"	Marion Biggs, for Mollie Pritcher	20 00
"	Sullivan Treat, for Dash	10 00
"	W. C. Meyer, for six colts	50 00
"	A. M. Stevenson, for Shiloh	100 00
"	John Hall, for Peggy Ringgold	75 00
"	John McLaughlin, for Liberty	50 00
"	Thomas Edwards, for Nancy and colt	40 00
"	Miller & Smith, for Juliet	30 00
"	Miller & Smith, for Kate and Mollie	40 00
"	John B. Redmond, for Water Prince	40 00
"	John D. Patterson, for Second Duke of Oak Home	20 00
"	Robert Branton, for Duke of York	10 00
"	Robert Branton, for Pocahontas	30 00
"	Robert Branton, for Lady Oxford	10 00
"	J. R. Rose, Napoleon	40 00
"	Seneca Daniels, Medoc	25 00
"	Seneca Daniels, Champion	20 00
"	J. R. Rose, Bloomfield	15 00
"	Seneca Daniels, Fashion	30 00
"	J. R. Rose, Fancy	25 00
"	J. R. Rose, Beauty	20 00
"	Isaac Daniels, Nancy	15 00
"	Isaac Daniels, Victor	10 00
"	J. R. Rose, Annie	10 00
"	Moses Sprague, Billy	25 00
"	Robert Branton, Tulip	30 00
"	H. H. Brainard, Jessie	20 00
"	Peter Burnes, Swan	10 00
"	J. B. Redmond, Lalla Rookh	50 00
"	Robert Branton, Pocahontas	40 00
"	J. V. Sims, Queen of Pacific	15 00
"	Thomas Cotter, ram	20 00
"	J. D. Patterson, one year ram	15 00
"	D. D. Satterfield, best three ram lambs	15 00
"	Thomas McConnell, best three ewe lambs, two years	15 00
"	Ellen McConnell, best three ewe lambs, one year	15 00
"	D. D. Satterfield, best five ewe lambs	15 00
"	J. D. Patterson, best F. M. ram	20 00
"	J. D. Patterson, best three ram lambs	15 00
"	J. D. Patterson, best three ewes, three years	15 00
"	Ellen McConnell, graded ram, two years	15 00

Date.	On what account.	Amount.
Sept. 15....	D. D. Satterfield, graded ram, one year.....	$10 00
"	Richards & Taverner, three ram lambs.....	15 00
"	Francis Graham, three ewes, two years.....	10 00
"	Thomas Cotter, three ewes, one year.....	10 00
"	Richards & Taverner, five ewe lambs.....	10 00
"	J. D. Patterson, best ram.....	25 00
"	Ellen McConnell, best ewe.....	20 00
"	Ellen McConnell, five ewes, aged.....	25 00
"	Norman Woodbeck, best six pigs.....	20 00
"	Robert Branton, best large sow, two years.....	10 00
"	Robert Branton, best large sow, one year.....	10 00
"	P. Burnes, best boar.....	10 00
"	R J. Merkley, premiums for fowls.....	35 00
Sept. 25....	Paid B. Dennery, use of crockery.....	41 50
Sept. 27....	Mrs. J. E. Benton, premium on picture	20 00
"	Wells, Fargo & Co., diplomas and freight.....	52 00
Sept. 29....	Massol & Merwin, nails, etc.....	19 93
"	Russell & Winterburn, printing.....	10 00
"	L. E. Cram, horse hire for Marshal.....	48 00
"	Wm. Fern, premiums on vegetables	32 00
"	Friend & Terry.....	17 06
"	P. H. Murphy premium on reaper.....	10 00
"	P. H. Murphy, display of reapers, etc	5 00
"	Treadwell & Co., premium reaper and mower.....	10 00
"	Baker & Hamilton, premium on mower.....	10 00
"	Baker & Hamilton, premium on cultivator.....	5 00
"	Baker & Hamilton, premium on ploughs.....	10 00
"	John Mott, premium on side-hill plough.....	5 00
"	John Mott, premium on stubble plough.....	10 00
"	B. T. Ready, premium on double plough.....	10 00
"	S. W. Prebble, premium on knitting machine.....	5 00
"	Jane Brooks, premium on wax plant.....	2 00
"	Mary Hurd, premium on chenille work	3 00
"	Mrs. Charles Holbrook, for bead embroidery.....	3 00
"	Hittie Reynolds, for tatting and leather work.....	6 00
"	L. Klays, for embroidered picture.....	3 00
"	Mrs. G. A. Putnam, for ottoman cover.....	3 00
"	Mrs. J. P. Odbert, for raised worsted.....	3 00
"	Mrs. Lyman Wells, for embroidered chair.....	3 00
"	Mrs. Lyman Wells, for lamp mat.....	3 00
"	Miss Minnie Tukey, for crochet shawl.....	2 00
"	Chas. Strobell, for best cone work.....	3 00
"	Mrs. L. P. Lowell, for best worked quilt.....	3 00
"	Mrs. M. S. Lytle, for best wax fruit	2 00
"	Mrs. E. Blake, for best woolen socks.....	2 00
"	T. Hansbrow, best stove and range..... ..	10 00
"	J. Hopley, for best furniture of many varieties...	44 00
"	Antone Menke, for best willow ware.....	3 00
"	J. E. Parker, for best set of carriage harness.....	5 00
"	J. Gates & Bros., for best chemicals.....	3 00
"	M. & A. Wilcox, best mining pump.....	10 00

Date.	On what account.	Amount.
Sept. 29....	T. Hansbrow, for best irrigating pump	$10 00
"	Goss & Lambard, for best iron and brass work	5 00
"	I. L. Merrell, best asphaltum for roofs	3 00
"	J. Johnson, best collection of California marine plants	3 00
"	S. E. Phelps, for Hall's Hair Renewer	3 00
"	Edwards & Co., for best stationery	3 00
"	R. Ireland, for best brooms and matches	3 00
"	Oschner & Laauser, for best wine cask	3 00
"	I. L. Merrell, for best lanterns	3 00
"	A. S. Dickenson, for best patent lamps	3 00
"	Mrs. Mary Chisman, for rug and cushion	3 00
"	Mrs. J. P. Odbert, crochet bedspread	3 00
"	Mrs. J. M. Audrain, crochet work	3 00
"	Mrs. E. G. Holmes, for knit tidy	3 00
"	Miss Clara Henley, for needle work	3 00
"	Brown, Grover & Baker machine	5 00
"	Miss Sarah F. Smith, for tatting work	3 00
"	G. W. Cord, for best grape crusher	5 00
"	C. D. Turner, detecting money drawer	3 00
"	H. C. Bussey, for best combination lock	3 00
"	Griffin & Hayes, best hay lifter	5 00
"	W. Grafton, best two bushels Chile wheat	10 00
"	E. Kirkham, best two bushels American wheat	10 00
"	Mrs. M. S. Hurd, for best peach jelly	3 00
"	Mrs. M. S. Hurd, best blackberry jelly	3 00
"	Mrs. R. J. Merkley, for best preserved quinces, peaches, apples and plums	12 00
"	A. Bergman, for best pickles, etc	16 00
"	J. P. Odbert, for best apple jelly	3 00
"	Mrs. E. B. Crocker, for best preserved fruits of various kinds	18 00
"	Mrs. R. Robinson, for best variety of jellies	10 00
"	Mrs. R. T. Tiffey, best honey	5 00
"	J. R. Nickerson, best tomato catsup	3 00
"	B. N. Bugbey, best white wine, one year old	5 00
"	B. N. Bugbey, best exhibit foreign wines	5 00
"	J. R. Nickerson, best red wine, one year old	5 00
"	B. N. Bugbey, best ex. wines from native grapes	5 00
"	B. N. Bugbey, best brandy, one year old	5 00
"	B. N. Bugbey, best white wine, one year old, from native grape	5 00
"	A. Runyon, best onions and squashes	6 00
"	R. J. Merkley, best beets, potatoes and carrots	26 00
"	J. S. Pond, for sugar beets and melons	7 00
"	J. R. Nickerson, for best forty varieties of apples	15 00
"	A. Runyon, for best twenty varieties of apples	10 00
"	J. R. Nickerson, for best forty varieties of pears	15 00
"	A. Runyon, for best twelve varieties of pears	5 00
"	J. R. Nickerson, for best twelve varieties plums	5 00
"	James Brooks, for best variety plums	3 00

Date.	On what account.	Amount.
Sept. 20....	Mrs. E. B. Crocker, best variety quinces	$5 00
"	J. R. Nickerson, greatest number of varieties of native grapes	5 00
"	J. R. Nickerson, greatest number of varieties of foreign grapes	5 00
"	J. R. Nickerson, greatest number of varieties of figs	3 00
"	J. R. Nickerson, greatest variety of dried fruits	20 00
"	B. N. Bugbey, best twenty-four pounds raisins	10 00
"	J. R. Nickerson, best ten pounds dried prunes	10 00
"	E. Pierce, best soft shell almonds	3 00
"	J. S. Pond, best peanuts	2 00
"	R. J. Merkley, best bread	3 00
"	Mrs. Chisman, for chair	5 00
"	Louis A. Smidt, pictures	3 00
"	Kate Crocker, for best cake	1 00
Oct. 1.....	T. J. Thompson, for hay	143 75
"	O. S. Carroll, for labor at Park	95 00
"	Deuel, Griffitts & Co., for sundries	12 25
"	W. P. Coleman, for expenditures	5 50
"	W. T. Crowell, for clerking at Hall	64 00
"	C. A. Stevens, for clerking at Hall	28 00
"	James L. Barnes, for police at Park	24 00
"	George P. Warner, clerk at Park	36 00
"	John Tingman, collector at Park	16 00
"	L. Preston, labor at Park	24 00
"	A. G. Hoagland, clerk at Park	24 00
"	Hiram Clock, labor at Hall	36 00
"	Benjamin Bullard, clerk at Hall	32 00
"	C. E. Crocker, collector at Park	24 00
"	E. H. Caffrey, collector at Park	24 00
"	F. Klotz, for wood	33 75
"	Huntington & Hopkins, sundries	60 38
"	J. Carlton, labor at Park	28 50
"	J. W. Hall, doorkeeper at Hall	24 00
"	T. Byrnes, labor at Hall	45 00
"	T. Sullivan, labor at Park	22 50
"	B. R. Crocker, hay, etc	205 42
"	William Mahan, labor at Park	34 00
"	L. B. Drew, doorkeeper at Hall	24 00
"	A. Edrington, labor at Park	27 50
"	N. B. Kendall, collector at Park	24 00
"	T. H. Hale, watch at Hall	36 00
"	—— Galloway, labor at Park	15 00
"	G. A. Cantine, labor at Hall	15 00
"	Francis Graham, old premium	5 00
"	E. Kile, labor at Park	39 00
"	David Wood, carpenter at Hall	40 00
"	O. T. Davis, premium on fruit	2 00
"	Mrs. W. W. Marvin, premiums on fruit	19 00
"	Lyman Allen, for straw	83 60

Date.	On what account.	Amount.
Oct. 1.....	Mrs. Blackleach, scarfs, etc.....	$17 75
"	Hamburger & Co., ribbons, etc.....	23 00
"	California Farmer, advertising.....	50 00
"	James Anthony & Co., advertising.....	152 37
"	Captain Deal, police at Park.....	24 00
"	Thomas McIntyre, police at Park.....	25 00
"	Thomas Baker, Superintendent at Hall.....	55 00
"	R. L. Bampton, collector at Park.....	24 00
"	C. Daniels, calking at Hall.....	5 50
"	S. Lipman, merchandise.....	2 00
"	Thomas Byrnes, labor.....	87 00
"	Orleans Hotel, rooms for guests.....	23 00
"	J. Johnson, boxing trees.....	130 00
"	J. Q. A. Warren, premium.....	50 00
"	T. F. Glover, clerk at Park.....	24 00
"	J. Johnson, labor at Hall.....	36 00
"	Philip Cohn, setting glass.....	3 00
"	George Whitlock, labor at Hall.....	61 00
"	Thomas C. May, drayage, etc.....	65 50
"	Mrs. Johnson, stewardess.....	21 00
"	McAlister, labor at Hall.....	20 00
"	Calvyn, painting sign.....	9 00
"	Ireland & Eldred, for brooms.....	6 50
"	M. R. Rose, boring wells.....	14 00
"	Fourth Infantry Band.....	500 00
"	Toll's Hotel, hack hire.....	12 00
"	D. L. Perkins, premiums.....	22 00
"	F. L. Lardner, Superintendent of Hall.....	40 00
"	J. T. Roberts, doorkeeper at Hall.....	24 00
"	Sacramento Gas Company.....	92 70
"	A. S. Taylor, collector at Park.....	24 00
"	David Cox, labor at Park.....	20 00
"	J. F. Clark, clerk at Hall.....	54 00
"	S. W. Burke, doorkeeper at Park.....	24 00
"	J. E. Smith, clerk at Hall.....	30 00
"	A. Prentice, clerk at Hall.....	8 00
"	B. R. Patten, clerk at Hall.....	24 00
"	J. Renz, setting glass.....	7 00
"	C. H. Krebs, setting glass.....	8 75
"	J. Roller, watch at Hall.....	28 00
"	Frost & Bibbens, posting bills.....	25 00
"	E. B. Ryan, clerk at Park.....	35 00
"	Jerome Madden, clerk at Park.....	25 00
"	John Isaac, police at Park.....	24 00
"	William Sharp, use of cloth.....	72 00
"	H. S. Crocker, printing.....	82 75
"	Hill & Knaught, premium.....	13 00
"	Daily Bee, advertising.....	24 50
"	S. E. Herrick, premiums.....	3 00
"	E. F. Aiken, premium on butter.....	10 00
"	R. J. Merkley, premium on vegetables.....	10 00

Date.	On what account.	Amount.
Oct. 1	R. J. Merkley, premium on vegetables	$1 00
"	Jennie Dwinell, premium	3 00
"	C. S. Lowell, for old warrant	195 84
"	N. L. Drew & Co., for old warrant	318 28
"	Briggs & Haskell, premium on apples, etc	20 00
"	C. Crocker, for old warrant	199 10
"	Huntington & Hopkins, for old warrant	12 26
"	M. R. Rose, for old warrant	17 50
"	B. F. Hastings, for old warrant	75 00
"	William Yule, on old warrant	145 53
"	A. P. Smith, premiums on stock and fruit	81 00
"	Friend & Terry, old warrant	119 30
"	John Rider, for old warrants	240 98
"	Locke & Lavenson, for old warrants	82 65
"	George H. Swinerton, for old warrants	30 00
"	W. F. Knox, for old warrants	51 03
"	H. Wachhorst, two goblets	24 00
"	M. S. Taylor, filling diplomas	17 55
"	D. W. Earl, old warrant	218 34
"	J. G. Allmond, premiums	15 00
"	P. Caduc, for ice	19 80
"	W. H. Devalin, premium	3 00
"	Mart Taylor, filling diplomas	11 05
"	A. H. McDonald, premium	2 00
"	John Smith, premium	2 00
"	E. M. Smith, premium	7 50
"	E. T. Anthony, repacking goods	5 00
"	Sacramento Bee, advertising	5 00
"	M. B. Bullard, premium	3 00
"	James Lansing, costs on taxes	118 45
"	George H. Baker, diplomas	21 50
"	H. M. Larue, premiums	10 00
"	I. N. Hoag, salary for October	150 00
"	R. Liddle & Co., premiums	10 00
"	M. S. Taylor, filling diplomas	9 75
"	C. F. Reed, expenditures	500 00
"	I. N. Hoag, expenditures and salary	307 52
"	B. R. Crocker, expenditures	15 00
"	C. Crocker, balance on old warrant	50 00
"	Joseph Shaw, old warrant	10 00
"	Charles E. Baine, old warrant	5 00
"	William Schacht, sprinkling street	6 22
"	J. Johnson, labor	18 00
"	Wells, Fargo & Co., diplomas	11 00
"	M. S. Taylor, filling diplomas	6 60
"	W. Moorhead, old warrant	20 00
"	E. M. Skaggs	14 50
"	H. Wachhorst, silver for premiums	35 50
"	Philip Caduc, for coal	2 75
"	D. O. Mills & Co., legal tenders	11 25
"	I. N. Hoag, salary, etc	150 75

Date.	On what account.	Amount.
Oct. 1.....	William Yule, old warrant.....	$96 00
"	N. G. Curtis, old warrant.....	704 00
"	Wells, Fargo & Co., old warrant.....	10 50
"	John Roche, old warrant.....	17 75
"	M. Pasquier, mending flag.....	3 00
"	Hammond & Co., old warrant.....	14 22
	Whole expenditure.....	$19,639 96
	Cash on hand.....	721 89
	Cash received.....	$20,361 85
	Old indebtedness paid since last report, including one note not included in account of last year, compromised.....	$3,693 44
	Balance outstanding, all in hands of one party, including interest to date.....	$3,851 30

MEETING OF THE BOARD.

DEATH OF R. J. WALSH.

At a meeting of the Board of Agriculture, held at the rooms of the Society, on the ninth of May, eighteen hundred and sixty-six, President Reed, in a few appropriate remarks, called the attention of the Board to the fact of the death of one of their number, the late R. J. Walsh, and suggested the propriety of appropriate action on the part of the Board. The following preamble and resolutions were thereupon drawn up by the Secretary and submitted to the Board, and passed unanimously:

WHEREAS, one of the members of this Board, Richard J. Walsh, of Colusa, Colusa County, has been removed by death since our last meeting, and that it is fitting and proper that some record should be made of the valuable services rendered by him to this Society and to the cause of agriculture in this State, and also of the sincere sorrow of the members of this Board; therefore

Resolved, That in the death of R. J. Walsh we deplore the loss of one whose wise counsels, generous liberality and efficient services have been of great value to the enterprise in which we are engaged; whose intelligence and energy in advancing the art and science of agriculture have presented an example worthy of imitation and entitle him to the gratitude of the farmers of the State. He was a man whose soundness of judgment, sincerity of purpose, purity of character, cordiality of manners, kindness of heart and high social qualities won the esteem, the confidence and the love of all who knew him.

Resolved, That this preamble and resolutions be entered on the minutes of this Board, and a copy of the same, duly signed by the President and Secretary, be presented to the widow of the deceased, with the assurances of our sincere sympathy in her bereavement.

ELECTION OF OFFICERS.

At the same meeting the Board unanimously re-elected the present incumbents, I. N. Hoag for Secretary and R. T. Brown for Treasurer.

STANDING COMMITTEES.

The President announced the Standing Committees, as follows:

Finance—The President and Secretary (ex officio) and Mills.
Library—The Secretary (ex officio), Wheeler and Beck.
Publication—The President and Secretary (ex officio) and Coleman.
Visiting—Carroll, Crocker and Richardson.

PARIS EXPOSITION.

On motion of Mr. Carroll, the following resolutions were adopted:

Resolved, That this Board deem it of the highest importance that this State be represented at the "Universal Exposition" to be held at Paris, commencing on the first of April, eighteen hundred and sixty-seven, by samples of her agricultural, horticultural, manufacturing and mineral products.

Resolved, That we take the necessary steps for the accomplishment of the above object, and that we appeal to the people of the State to second our efforts in the premises; also, that the Secretary be authorized to issue the necessary circulars, giving the necessary information, and calling for contributions of articles representing the various industries of the State, to be collected before and at the next Fair, preparatory to shipment to Paris.

The President and Secretary were appointed a Committee to revise the Premium List and to report at the next meeting.

The Board adjourned to the eleventh, at eight o'clock P. M.

RE-ASSEMBLED.

On May eleventh, at eight o'clock P. M., the Board met, as per adjournment.

President Reed in the chair, and Trustees Mills, Carroll, Crocker and Coleman present.

The Committee on Premium List reported a full list, which, after a few amendments, was adopted.

The Board then proceeded to the election of a Director, in place of R. J. Walsh, deceased, and R. B. Woodward of San Francisco was elected.

By invitation of the Board, Mr. Louis Prevost, who was feeding some silkworms in the main hall of the Pavilion, appeared before them and in his enthusiastic and interesting manner related some of his experience and views as to the introduction of the silk culture into this State. When retiring he expressed his gratification at the interest manifested by the members of the Board and its officers in the success of the enterprise in which he was engaged, and a hope that he would live to see his fondest ambition realized—to see his adopted State, California, producing all the silk her people wanted for consumption.

In view of the importance of the subject, and with a desire to encourage the enterprise of silk culture in this State, the Board passed the following resolution:

Resolved, That this Board commend the untiring zeal and industry manifested by L. Prevost in overcoming the many difficulties he has encountered in his efforts to prove this State adapted to the important industry of silk culture, and by improvement in management and econ-

omy in labor to render the business not only practicable but profitable, and we congratulate him and the people of this State upon the success with which his efforts have been attended, and upon the prospect that the industries of silk culture and manufacture will soon rank among the leading industries of the State.

PRERARATIONS FOR THE PARIS EXPOSITION.

Under the authority given the Secretary, he opened correspondence with Wells, Fargo & Co. and with Captain O. Eldridge, agent for the Pacific Mail Steamship Company, and secured the interest of both companies in behalf of a creditable representation of the products of the State at Paris, to such an extent that the former company very liberally proposed to take charge of all freight from the State Agricultural Society for the Exposition, at San Francisco, and deliver it to the United States Agent at New York, free of charge, and the latter to transport the same on their steamers free.

Having secured this favorable arrangement he issued the following circular—which was sent all over the State, to individuals and to the press. Many of the latter took up the subject in good earnest and urged the people to become exhibitors and send on their products:

World's Fair, or Universal Exposition, to be held at Paris, commencing April first, and ending October thirty-first, eighteen hundred and sixty-seven.

To the People of California: The above exhibition of the products of the industries of the world is under the auspices of the French Government. All the nations are invited and will probably take part, and place on exhibition for comparison with each other, and with all others, the substantial evidences of their resources, prosperity and civilization.

The world will be the audience and the judge of the relative position to which each nation and State is entitled in this peaceful and honorable strife for precedence. Congress has wisely determined that the United States shall enter the list of competitors for the first rank in the world's march of real and civilizing improvement, and has appropriated $100,000 to assist the people in securing for themselves the much coveted distinction and the consequent benefits to our common country. Our own Legislature and our State authorities having failed to take any steps to secure the representation of our noble State, with her boundless resources and valuable productions, on this great occasion, the Board of Agriculture, fully appreciating the importance as well as the extent and responsibility of the undertaking, have determined to place the products of the agriculture, horticulture, the mines and manufactures of California by the side of those of her sister States and of the other

States of the world, and respectfully ask the fair comparison and candid decision of the people who may examine them. In this undertaking, to be successful, the Board will need, and earnestly and confidently ask the co-operation and personal assistance of every man and woman who has the prosperity of our State at heart, and who can contribute anything of interest or value to California's exhibition at the World's Fair.

The following is the joint resolution which Congress has adopted in aid of the exhibition of the United States. It provides for securing all the advantages to our country of such an undertaking, and will serve to give to all a correct idea of those advantages as applicable to our own State:

First—That $48,000 may be expended in procuring the necessary furniture, fixtures, etc., to properly exhibit what is sent there from this country.

Second—That agents may be employed in New York and Paris, at $2,000 each per year, and four clerks in each city at salaries of $1,400 and $1,600 each, respectively.

Third—That ten professional and scientific Commissioners may be appointed by the President, at a salary per annum of $1,000, to investigate the ten groups of productions of our industry and ingenuity and report their views in conjunction with facts concerning the prosperity of the world and evidences of civilization there exposed.

Fourth—Governors of States are requested to invite the patriotic people of their respective States to assist in the proper representation of the handiwork of our artisans and the prolific sources of the material wealth with which our land is blessed.

Fifth—That the ten Commissioners are to be selected from the various sections of the Union.

Sixth—That all Agents, Commissioners, Clerks or any other employés authorized by this resolution shall not serve more than one year.

Seventh—That the President may detail war vessels to transport to France such articles as persons may wish to exhibit.

Eighth—That the general appropriation is limited to $100,000.

All articles intended for the Paris Exhibition will be received by the Board of Agriculture, at Agricultural Hall, in Sacramento, at any time before the tenth day of September next; will be exhibited at our State Fair, and then shipped, free of expense, to New York, where the Government agent will receive and forward them to Paris, and, if desired, will be returned free. The Board will have a representative at Paris who will give the necessary attention to all articles forwarded by them for exhibition.

With all these facilities the Board, with confidence, call on the people of California to make for our State a creditable representation of all the products of our industries and resources at this great Fair of the World.

The benefits to be secured for California by a good display on the occasion are too obvious to require enumeration or mention.

Having done this, hundreds of especial letters were written to individuals, urging them personally to send on articles for the Exposition. But very little success attended all these efforts—so slow are our people to move in any enterprise, especially a new one, unless they can begin to pick up the dollars from the very start—and hence the necessity of aid or inducement from the State when any common benefit is expected to ensue. No one individual in this country desires to lay out his individual money to produce a result that will be of no more value or ben-

efit to him than to any other citizen of the State; and it is really not right or proper that he should be called on to do so. The truth is, our Legislature of eighteen hundred and sixty-five and eighteen hundred and sixty-six should have given moral sanction and substantial aid to this enterprise, and thus have secured a proper representation of the products of our State at this great exhibition; and then they should have provided for the payment of a competent man to go there in charge of them, to exhibit and explain them, and to place before the people of the Old World the advantages our State possesses for immigrants over any of our sister States.

One of the best opportunities for spreading useful and timely information at a most desirable place was thus lost to the State. No one who shall read Mr. Wadsworth's lecture, or Professor Blake's report, published in this volume, will doubt the correctness of this proposition.

LIST OF ARTICLES.

After all the trouble and pains of the Society, the following meagre list embraces all that was sent by them to the Exposition:

Four cases assorted wines, from B. N. Bugbey, of Natoma Vineyard, Sacramento County.

Three cases from Dr. J. Strentzel, of the Alhambra Vineyard, Contra Costa County.

One case from C. Detten, San Joaquin County.

One case from Williams & Wilson, of the Golden State Vineyard, Santa Clara County.

Four cases from Matthew Keller, of Los Angeles.

Six cases from Kohler & Frohling, of Los Angeles.

One bale of hops, from Flint & Haynie, of Sacramento County.

One box, containing one hundred and twenty varieties of garden seeds, and four varieties of sweet corn, from D. L. Perkins, of Alameda County.

One box of raisins and one box of dried figs, from J. R. Nickerson, of Placer County.

One case of hats, from J. C. Meussdorffer of Sacramento.

One steam pump, from C. H. Harrison of San Francisco.

A few specimens of minerals, from the Cabinet of the Society.

Some other articles were received and turned over to the Committee of the Chamber of Commerce of San Francisco and forwarded by them.

Two of the members of the Board, Edgar Mills of Sacramento and R. B. Woodward of San Francisco, were commissioned as delegates from the Society and attended the Exposition. Also, Professor William P. Blake, the Geologist to the Board, and Dr. T. M. Logan, the Meteorologist to the Board, went as delegates. Professor Blake was also commissioned by the Governor—under a resolution by the Legislature—but no money was appropriated for his pay, or even to bear his expenses or any part thereof. Justice to Professor Blake and the dignity of the State would dictate that he should yet be paid for his disinterested services and his valuable report.

It is to be hoped that California will never let another such an opportunity to serve her own interests at so little cost pass unimproved. For an account of the Exposition and the California products at it, reference is made to Professor Blake's report and Mr. Wadsworth's lecture.

OPENING ADDRESS.

BY CHARLES F. REED, PRESIDENT.

DELIVERED BEFORE THE STATE AGRICULTURAL SOCIETY, SEPTEMBER 10, 1866.

Ladies and Gentlemen, Members of the State Agricultural Society: I congratulate you to-night upon this auspicious meeting. The occasion which has brought us together is pregnant with noble objects. We are assembled here this evening not as the representatives of any particular theory or practice in any department of life, nor as the exponents of any particular creed, political, sectional or otherwise. We come together not as agriculturists, seeking the advancement exclusively of our own special interests; we come not as miners, to devise schemes for the advantage alone of our peculiar and hazardous occupation; nor do we come as mechanics or artists, having in view exclusively improvements in machinery or greater perfection in the arts. We are assembled here the representatives of all these interests—the conservators and improvers of all the industrial occupations of the people of the great Empire State of the Pacific coast.

Laying aside all recollections of caste—all differences of opinion—all distinctions of birth or occupation—let us, in the spirit and inspiration of the occasion, unite in friendly and mutual enjoyment, in ennobling and beneficial improvement.

The annual Fairs are as stations by the wayside on the journey of life, at which, as travellers, we collect together, look back and talk over the incidents, and caution each other against repeating the errors of the past, and drink in new inspiration and intelligence, and form new resolutions for better and greater progress in the future. They should be, and in this country they really are, the workingman's and workingwoman's holiday—the practical industrial colleges for the people—the beacon lights to lead us to avoid the shoals of failure and disappointment and guide us on to a higher civilization and more perfect state of existence.

This hall to-night presents a comprehensive index of the present stage of the civilization of the world. It opens before our eyes a great volume, in which is faithfully recorded, and from which all may correctly read, the true difference between man in a cultivated state and man as a savage.

This collecting together within our view the many rich products of the varied soils and climates of our mountains and valleys, of our seacoasts and river borders, affords our farmers and horticulturists rare opportunities for comparison of notes, interchange of experiences and opinions, and consequent valuable improvements. The miner sees here specimens of our mineral deposits, collected from every nook and corner of our great State, whose auriferous soil is so studded with gems of priceless value, whose gorgeous mountains are so rich with ledges of exhaustless wealth, and whose whole surface is so marvelous and anomalous in geological formation. He compares these specimens one with another; he learns from their labels the particular location from which each was taken; observes by their classification the geological formation of that locality, and comparing these items with his own past experience, he goes back to his employment, if not a more scientific, yet certainly a more close and practical observer—a more skillful and successful miner.

The ingenious mechanic, the skilful artisan, the practical inventor, the tasteful artist, the profound professional man, the learned historian and the sagacious statesman—all here find prolific food for reflection and useful lessons for improvement, each in his own particular calling or occupation.

Viewed from any standpoint, exhibitions like the one before us tend to promote, in a greater or less degree, the progress of civilization, and contribute to the comforts, the enjoyments and the happiness of the human race.

The ladies, too—who are said to be the result of a second and better-directed effort on the part of the Almighty in the creation of the human family, and consequently a great improvement on the production of his first effort, man—even they find here the wonderful, I had almost said intelligent sewing and knitting machines, with which they contrive, with so much greater ease and facility, to beautify, with the adornments of art, their own fair forms.

Nor should we forget the various other ingenious machines, all of which are contributing so much to mitigate the drudgery of life and bring comfort, intelligence and happiness to every household, and physical and intellectual improvement to mankind.

To the general observer and to the real philanthropist, these exhibitions of progress are rare feasts of enjoyment. They suggest instructive reflections upon the past and warrant high anticipations of a bright destiny in the future. But a few years since nearly all the labor on our farms and in our workshops was done by hand or with implements so clumsy that they were of but little value.

The plough—the great pioneer and type of all other agricultural implements—has received all its important improvements since the beginning of the nineteenth century.

The first iron plough was made by a farmer in Scotland, in eighteen hundred and four—only sixty years ago. Up to this time all the ploughs used in the world were mere wooden contrivances but little superior to the crooked branches of willow described by Virgil in his pastoral poems, and used by the ancient Roman.

The first cast-iron plough ever made was patented by Charles Hewbold, of New Jersey, in seventeen hundred and ninety-seven, and since that time the improvements made to that instrument—and principally by the genius of American mechanics—and the consequent extended use of it, have revolutionized the agriculture of the world.

One man with eight horses and a gang-plough, and the improved harrows and cultivators of the present day, will do more and better work in putting in grain than fifty men with fifty ploughs and two hundred horses three quarters of a century ago.

Those great labor-saving machines, the reaper and mower, are of recent origin. The first American patent for cutting grain was issued to Richard French and J. T. Hawkins, of New Jersey, in eighteen hundred and three. There are now not less than two hundred different kinds in use; and the combined product of American manufactures to the present time is over three thousand reapers and mowers.

The great importance to agriculture of these machines cannot be estimated. We may form some conception of the increased production of the grain of the world when we reflect that one machine will cut on an average ten acres of grain in a day, and the three hundred thousand all at work at the same time would cut over three millions of acres in twelve hours—a work greater than could possibly be accomplished by the combined labor of all the inhabitants of the United States, by the use of the old-fashioned implements—the scythe and cradle. And yet, to run the three hundred thousand reapers would not require more than six hundred thousand laborers—leaving, according to the estimated population of the United States, over fifty millions for other employments.

The world will never forget those who have been foremost in improving and bringing the reaping machine into use. While kings and crowned heads will be forgotten, the names of Hussey, Manny and McCormick will be remembered as long as time shall last, as the benefactors of the human race—the true heroes of peace.

The improvements in threshing machines since the commencement of the nineteenth century have been no less important, and their effects upon the industries of the world no less striking.

Within the memory of one third of those who hear me to-night much of our grain was threshed by the original process of tramping it out with cattle or horses on a smooth floor or circular space of ground in the open air. Such was almost exclusively the mode of threshing grain in California only seventeen years since, when the Anglo-Saxon took possession of this country; and yet to-day the threshing machines in use in California, improved by our California mechanics, and managed by our California farmers, may well challenge the world for comparison as to finish of workmanship or rapidity and excellence of execution.

Many of you will remember the effect produced upon the inhabitants of the Old World by one of Pitt's threshing machines, while running at the World's Fair, held a few years since, at Paris. A leading French paper, the Moniteur, said of it: "This machine literally devours the sheaves of wheat—the eye cannot follow the work which is effected between the entrance of the sheaves and the end of the operation. It is one of the greatest results which it is possible to obtain. The impression which this spectacle produced on the Arab Chiefs was profound." And we are told by another writer that "the effect was no less wonderful on the Prince Napoleon, who returned twice to examine the machine, and declared it was 'frightful to look at.'" And here allow

me to remark, parenthetically, that the improvements in agricultural implements, and consequent increase of agricultural products in America, are, more than any one cause, swelling the tide of immigration from the Old to the New World; and by their civilizing influences on the masses, causing the crowned heads of Europe to tremble on their thrones. With our ploughs, our reapers and our threshing machines we are carrying democracy into the Old World and undermining the foundations of those thrones themselves. Thus, by the cultivation of the arts and implements of peace, we are banishing from the world the prime causes of war. We are driving from the minds of mankind passion, ignorance and superstition, and substituting in their stead reason, intelligence and virtue.

I have spoken of a few of the many and important agricultural implements which are rapidly coming into use, and which are producing such a beneficial influence upon the wealth and rural economy of the nation. It is unnecessary to name and trace the effects of more individual discoveries. By an examination of the statistics of the eighth census of the United States, we may form some idea of the effects of labor-saving machines upon the wealth of the country. The cash value of farms under actual cultivation in eighteen hundred and fifty was three billion two hundred and seventy-one million five hundred and seventy-five thousand four hundred and twenty-six dollars. In eighteen hundred and sixty their value had increased to six billion six hundred and forty-five million forty-five thousand and seven dollars, more than doubling in ten years. The amount of capital invested in implements of machinery for their cultivation in eighteen hundred and fifty was one hundred and forty-one million five hundred and seventy-one thousand eight hundred and thirty-eight thousand dollars; and in eighteen hundred and sixty, two hundred and forty-six million one hundred and eighteen thousand one hundred and forty-one dollars—an increase of over sixty-three per cent. in ten years. The increase of population during the same period was thirty-five per cent.—thus showing that in consequence of improvements and more general use of agricultural implements the wealth of our rural population is increasing much faster, more than twice as fast as their numbers. Such facts are highly gratifying to us as a nation, and they have their influence upon the diplomatic intercourse between our and other nations; more especially when our improvements in firearms, artillery and iron-clad Monitors are to be taken into consideration. A nation composed of a people of such expansive genius and unbounded energy as ours, with such inexhaustible resources, ought, at least, to be respected abroad.

Now, it becomes an interesting and important inquiry, to what active causes or moving incentives are to be ascribed these improvements and consequent increase in wealth and power of our people. We have seen that the principal improvements date from about the beginning of the nineteenth century, and at about the same period we should expect to find the active causes which induced them or gave them such a striking impulse. In looking over the origin of a great number of our first agricultural societies, we find they generally have their date about the end of the eighteenth and beginning of the nineteenth century—the first two in the United States having been established in seventeen hundred and eighty-five, in South Carolina and Pennsylvania. These were rapidly followed by the establishment in nearly all the States in the Union of similar associations. The system of annual Fairs and exhibitions of farm implements and farm products inaugurated by them brought the

people together in honorable emulation, and gave them opportunities of observation and improvement, which thousands of years of isolated and individual exertion and experience could not have afforded them—and we have noticed some of the results. Yes, fellow members of the State Agricultural Society, to just such associations as ours, to just such exertions as we are making, more than to any other cause, is the nation indebted for its wealth, its power, its good government at home, its honor and consideration abroad. Through such societies the people of the United States are prepared to be the heroes, not only in war, but in peace; fitted to become the heroes of any emergency—whether it be to put down a rebellion with the sword or maintain a principle with the ballot. It becomes not only an individual interest, but a patriotic duty we owe to our State and country, to support these associations not only with our money, but with the sanction of our presence, and the contribution of our handiwork and the product of our soil. The man who does not think it will pay to do so does not comprehend his own interest or his duty to his country.

Many of you have to-day, and more will to-morrow, visit the Fair Grounds to examine the splendid specimens of stock on exhibition. The plump, long-bodied and short-legged Berkshire swine—the fine-wooled and symmetrically-formed Spanish and French merino sheep—the broad-quartered, velvet-coated Durham cattle—the beautiful, fleet-footed, peerless thoroughbred horses—to be seen there are all the results of improvement brought about by observation and experiment, judgment and science, learned through the medium of agricultural societies. Without the judicious crossing of approved breeds with an eye to fleetness in trotting and running—without the systematic traits of speed and endurance upon the race track—without superior care in nursing and feeding for a long term of years, and through many generations of their ancestors, the renowned "Dexter" might have been to-day an insignificant cart-horse, and the celebrated "Norfolk" an unknown English hunter.

The improvement of the speed, endurance and courage of our horses is fast coming to be recognized by our best informed people as a great national interest. Those best qualified to judge attribute much of the success of the rebel cavalry in the earlier stages of the late rebellion to the superiority of their fine blood horses. Those who object to the improvement of our horses in this manner should be classed with the members of a Farmers' Club in the days of Sir Robert Peel. Thinking to do the Club a great favor, and through them to improve the agriculture of the shire, he presented them with two iron ploughs of superior construction. Upon his expressing his surprise, when he next visited them and found the old wooden ploughs still in use, one of the members replied: "Sir, we tried the iron, and be all of one mind—that they made the weeds grow."

Only half a century since the farm laborers destroyed all the agricultural implements in a neighborhood in England because, as they alleged, the use of them was an infringement on their rights to labor. The same blind prejudice exists to some extent among certain classes, even to this day, against railroads—the most effective agency for the development of the resources of a country yet known. If, then, the Pacific Railroad shall have been completed, and the iron horse shall have been fully groomed, trained and let loose upon the track for that long race across the continent, then a new era will dawn upon the agriculture of the Pacific Coast. Then you who are exhibiting your superior grains,

your unequalled vegetables and fruits, your delicious grapes and wines, your fine wool, cotton and silk, and the California fabrics manufactured from each; you, at this State Fair, who have brought down here from the mountains the magnificent evidences of the boundless resources of our mines; and you who have on exhibition at the Stock Grounds your fine-wooled sheep, your Cashmere goats, your beautiful and substantial cattle and matchless horses—will there meet your Eastern brothers in honorable and proud competition for the favorable judgment of the world upon the superiority of your products. And who that has witnessed your contributions to this magnificent exhibition can for a moment doubt the result.

No stranger who visits these California exhibitions but goes away with wonder and astonishment. We have no fears of a comparison with the products of the world—we only wait for the opportunity. Then, haste the day when that greatest of man's undertakings shall be accomplished! We have reason to believe, from the bold energy and untired perseverance displayed by the gentlemen having charge of this great work, that the day of its completion is near at hand. Indeed, we know they will succeed, and that rapidly; for they are members and warm friends of the State Agricultural Society, and they have no scruples in staking their money on the fleetest and longest-winded horse. In the meantime, fellow-farmers, let us do our duty to ourselves and our country. Let us go to work on our farms with a full realization of the fact that they are to be not only our homes for life, but the homes of our children for generations to come. And here allow me to congratulate you, that owing to the wise and united efforts of our representatives in the last session of Congress, we have a good prospect of the speedy settlement of all our land titles. Then each man can obtain a fee simple to his home, and each man's house will in fact, as in fiction of law, become his castle, and his family will have a real interest in its improvement. We should not forget that the soil in California, though very superior, cannot long hold out under the system of constant and unwearied cropping which is now so universally practiced. The dairyman cannot make butter or cheese unless he feeds his cows. The farmers cannot long continue to raise good wheat or barley, or any other crop, unless he manures his land. Nothing should be allowed to go to waste in California that will enrich the soil. Land, like everything else in nature, requires rest, food and change. Rotation in crops will insure these, and consequently more profitable returns to the husbandman.

One of three great drawbacks upon the agriculture of California has been the cultivation of too much land and too limited a number of products. Under such a system the farmer must grow poor as well as the farm. If his crops are good the market is overstocked and prices unremunerative. If poor, he has nothing to fall back on and the labor of the season is lost. In a warm, dry climate like ours, in the Summer season, very few things add so much to the beauty and home comforts of the farm-house as the surrounding shade trees and shrubbery. They also become useful in counteracting the effects of the destructive north winds, and in protecting the growing crops from the chilling sea-breezes that sweep our plains in the early Spring. The general effect of trees upon the climate of a country should not be overlooked in California.

Without forests the earth would rapidly become one vast desert; with them, a Sahara could be made to "bud and blossom as the rose." Our timber for wood and other purposes is rapidly vanishing before the woodman's axe. These considerations suggest the growing of forests in

our rural districts, and the subject is commended to your enlightened action. Experiments in the irrigation of our lands for many kinds of crops made in different parts of the State have been attended with very gratifying results and warrant the undertaking of a general system of canals for controlling the waters of our rivers for such purposes. Our last Legislature made a move toward the introduction of such a system, and if followed up by wise legislation and judicious action, California will one day become the garden and granary of the world, controlling in the commerce of nations the price of breadstuffs, as she does now that of the precious metals. One of the great wants of our new State of unbounded resources has been an institution which should serve as the repository of all practical and scientific information, and at the same time in connection with our agricultural societies become the enlightened guide and leader in the development of those resources. Such an institution we are about establishing. I refer to the Agricultural, Mining and Mechanic Arts College.

Our State Legislature has wisely provided that the institution established in California, under the endowment of the General Government, and which is to receive the patronage of the State, shall embrace in its object a more thorough knowledge of the arts and sciences which lie at the foundation of all our industrial pursuits. Agriculture, horticulture, mining, mechanics and manufactures are all to be promoted, not only by teaching thoroughly the sciences upon which each depends, but also the actual practice or art of conducting in the most approved and economical manner every department of business relating to each. Such an institution, located with strict reference to accessibility and adaptability of climate and soil, and furnished with the necessary apparatus and facilities for accomplishing the object for which it is established, must prove of immense value to our State and to the United States. No school of a similar character established in any other State or country can possibly present to the student the advantages which will be presented to him here. No other State or country has such a variety of resources at hand in the practical development and active working of which the students of our college, if properly located, will be called upon personally and experimentally to engage. Not only the theory, but the practice in every department of industry will, in this institution, be carried to the highest stage of perfection. As we are the centre of the mining interests of the world, the mining department of our college will become the centre from which will radiate the mining knowledge of the nations. Such an institution will give an impulse to improvement and progress in this State heretofore unknown.

Our past history, through the instrumentality of our agricultural and mechanical societies and the cosmopolitan character of our people, is one unparalleled in the world. But seventeen years ago California was regarded by all of us who were attracted to her shores in that early day of no earthly value except for her gold. Gold was her only product, her only export. Seeking, digging, washing, hoarding gold was the only occupation of her people. Now we produce all the necessaries and nearly all the luxuries of life. Now we are exporting wheat, flour, oats, corn, barley, beans, leather, hides, tallow, pitch, resin, turpentine, wool, woolen goods, wines, brandies, preserved fruits of nearly every variety, diamonds, silver, quicksilver, copper, lead, plumbago, manganese, borax, sulphur, and many other articles, to all parts of the world. We are also producing and manufacturing tobacco, cotton, silk, coal oil, castor oil, and will soon number among our new and valuable products beet sugar,

syrup, rice, tea, Peruvian bark and many of the nuts and spices of the tropical climates.

In eighteen hundred and sixty-seven California will be represented, under the auspices of this society, at the World's Fair in Paris, with minerals and precious metals, which, for variety and richness, cannot be surpassed; with ample samples of our cereals, not excelled by those of any other country; with wines and brandies, which, considering their age, may at least be shown and compared at her Capital with those of the heretofore best wine-producing districts in the world; with silk cocoons, raw manufactured silk, which are unmistakable evidences that our State can successfully compete with France, Italy or Japan in the production of that most costly and valued article; with machinery for various purposes, of California invention and California manufacture, of which the world may well be proud.

If we have done thus much and made for our State so proud a record under the circumstances which we have been placed in the short space of seventeen years, give us a well appointed industrial college to co-operate with our agricultural and mechanical societies, all well patronized and supported by our people, and what may we not anticipate for our noble State hereafter? If we are to judge of the future by the past, a proud destiny awaits us. That destiny is in our own hands. What we resolve, it shall be. From the evidences before me—the interest manifested in this exhibition, the intelligent, beaming countenances of the men, the cheerful, approving smiles of the ladies, I am content to leave that destiny in your hands, and thanking you for your kind forbearance and attention, I will commend it to your keeping.

ANNUAL ADDRESS.

DELIVERED BEFORE THE STATE AGRICULTURAL SOCIETY AT THE ANNUAL FAIR, SEPTEMBER TWELFTH, EIGHTEEN HUNDRED AND SIXTY-SIX.

BY JOSEPH W. WINANS, ESQ.

Mr. President and Gentlemen of this Society: After a long period of itinerant probation which accompanied and aggravated its earlier struggles for success, we may at length congratulate ourselves and the whole country that the State Agricultural Society has attained a fixed and permanent location, not only for the management of its official business, but also for the holding and celebration of its annual Fairs. Through the fluctuations and turbulence of former years it was driven here and there, until at last the ark has found its Ararat and floats no more upon the billows of contention. You will pardon my allusion to the scenes and actions of your earlier days, because they constitute events "of which," in the language of the Latin bard, "I was a part" And what more favored spot in all the broad domain of California could have been chosen for its site than this fair City of the Plains, the Capital of the State, the center of its population, sitting like a queen in regal state upon the margin of the turbid Sacramento?

Another year has rolled away since we were last assembled in these halls—a year prolific of increase and promotive in unusual degree of those great interests which we have met to advocate. Seed time and harvest have come and gone, and Ceres has poured forth the choicest gifts of grain and fruitage from her golden horn. No more the clarion of war is heard echoing throughout the land and marshalling its victims to those fields of blood whose harvests bow before the sickle of the reaper, Death, for we are gleaning our trophies from another field where the ploughshare has transferred its rust unto the cannon, and the scythe now supersedes the sword. Peace, benignant peace, hath shed her radiant smile upon a nation once rent by faction and intestine strife, but happily restored to its integrity with not one State dissevered nor one

star destroyed. For the constellation of the Union, so long wrapped in thickly-rolling clouds, shines out again without one Pleiad lost.

Although the time has not arrived when we shall render up our annual thanksgivings to the great Giver of all good for the inestimable blessings which he has bestowed upon our country in rescuing it from the perils of rebellion and disunion, and upon our State in preserving it from the ravages and alarms of war, yet we may well offer Him our homage, at this auspicious hour, for that peace which he has so happily restored; for that prosperity which He has so benignantly dispensed; for that plenty which He has so abundantly conferred upon our nation and ourselves, and for crowning the year with his goodness.

Of the three great producing interests of society which constitute the sources of national and individual wealth—commerce, agriculture and manufactures—important as each is in its relation to the general prosperity, it can hardly be denied that agriculture occupies the first, and manufactures the second rank in the promotion and development of public security and virtue. For commerce, while it oftentimes rolls in a tide of opulence which augments the nation's influence and wealth, yet it scarcely ever fails to end in corrupting the habits and undermining the principles of society by substituting luxury, licentiousness and enervation for enterprise, morality and vigor. And such is the lesson of all antiquity, from Tyre, in the far olden time, down to the declining day of Rome. In the contrast between commerce and agriculture are involved some of the gravest questions of political economy. Commerce, in the main, is a producing agent from abroad; agriculture is a developing influence at home. The one creates weakness and diffusion in the state by denying to its existence a self-sustaining power, and drawing from extraneous sources its means of support; the other brings forth and husbands the resources of the state, and causes it to derive from itself the material of its own advancement. It is the difference between the man who, having stored his mind with the acquisitions of others, becomes eminent for learning, and him whose mind, by its creating power, flashes from within the fires of genius—that difference which lifted Homer above Varro. The same contrast exists, also, between commerce and manufactures.

In considering the claims of agriculture we are first struck with the spectacle of its great antiquity. When the Divine fiat first cursed the ground for Adam's sake, it then decreed that from the earth man's bread should thenceforth come. And ever since that early day when it was declared that the sword should be turned into the ploughshare, the plough has been the universal and perpetual emblem of peace, prosperity and plenty. Stretching backward for its mythological origin into the shadows of that era when, by the inspiration of Ceres, Triptolemus became the inventor of the plough, agriculture has always been, from the remotest age of fable, a source of blessing to every nation and to every clime. It was this pursuit which gave character to the Saturnian or Golden Age—that reign of purity and peace on earth, when the people were blended in harmony, and all was primitive and simple in the thoughts and deeds of men, and human nature glorified itself in universal brotherhood, and lawlessness and violence were utterly unknown. Of this happy period saith the historian:

"The King of Heaven (Saturn) employed himself in civilizing the barbarous manners of the people of Italy and teaching them agriculture and the useful and liberal arts. His reign was so mild and popular, so

beneficent and virtuous, that mankind have called it the Golden Age, to intimate the happiness and tranquillity which the earth then enjoyed."

Visions of that rare beauty which rendered the Golden Age the more resplendent era of the world, and agriculture the noblest of pursuits, occasionally gleam down the descent of centuries through the didactics of Hesiod, the idyls of Theocritus, the pastorals of Bion and Moschus, the georgics and bucolics of Virgil. Let me not weary you in dwelling thus upon this period of time, for I regard it as strikingly suggestive of that amazing advancement in prosperity and progress which an agricultural people may attain at any period of the world's history, now and hereafter, just as well as then. Another incident connected with that era is not without its lesson and example at the present time. On the statues of Saturn were hung fetters to indicate the chains which Jupiter had once imposed upon him. For this reason it became a custom that all slaves who had acquired their freedom should dedicate their chains to him. And what more appropriate dedication of their fetters, in this great natal day of freedom, could the enfranchised millions of our former slaves now make than to devote them, not to Saturn, but to agriculture, that pursuit of which he was the illustrious developer and patron. If this large and most perplexing element of our people shall have their industry directed, as a mass, through voluntary, compensated labor, to the culture of the soil, not only their condition but the welfare of the nation will be essentially improved.

Again, agriculture is the truest and most reliable source of national wealth. This view does not design to disparage manufactures, of whose large influence and value we shall speak hereafter. It has been shown that commerce, while it pours in a broader stream of luxury and affluence than agriculture, has a more demoralizing influence upon men and manners. But the wealth of agriculture is attended and ennobled by a train of moral consequences; that of commerce is only useful in its material form. The one vitiates, the other simplifies the habits of the people; the one undermines, the other stancheons the bulwarks of the state. The wealth of agriculture is that whose value comes from its sufficiency to satisfy the wants and the desires which it provokes. It is that wealth which Seneca describes in saying, "If you live to opinion you never will be rich; if you live to nature you never will be poor." The primitive pursuits, the simple tastes, the limited cravings of an agricultural community are bounded by their acquisitions, and contentment cheerfully supplies the place of opulence. Not so with those riches which are gathered from the spoils of war or the commercial intercourse of nations, for these are evermore creating that insatiable thirst for profusion and display; that love of splendor which vents itself in the boast, "I will tear down my barns and build greater." Nor is agriculture without its liberal tribute to the material resources of the state. Plutarch tells us that at Rome the public treasure was kept in the Temple of Saturn as an intimation and monition to the people that agriculture is the source of wealth. And such was the theory of the Roman Empire in the great day of its grandeur and renown, before the Augustan age and the luxury of the succeeding generations had sapped the foundations of its virtue and its strength. In further illustration of our argument we refer to the fact that next to gold and silver, which, from their peculiar adaptation, form an arbitrary standard of value, and are therefore used as money, come the products of the soil, which constitute a secondary standard, being frequently employed as a substitute

for money and used as a medium of exchange. This is especially the case in the Western States of the Union, where whole communities exist by bartering the productions of the earth for the commodities of traffic, and especially for family supplies. If gold and silver have a standard, and, comparatively speaking, an unchanging value, so, within a more limited degree, have wheat and barley. It is a source of gratulation that this system has been freely adopted in our own State, so that a custom has arisen, and is growing into favor among farmers in the agricultural districts, to procure their commodities from the neighboring towns upon a temporary credit, and pay the debt in grain after they have harvested their yearly crops.

Again, agriculture stimulates and fosters the patriotic sentiment of a people. While society around him is shifting, transitory and unsettled, prone to the spirit of adventure or the temptations of a nomadic life, he who tills the soil becomes, as it were, a portion of its substance, acquires an attachment for the associations which surround him, grows fixed and local in his inclinations and his habits, and permanently plants his household gods amid those scenes where his broad acres spread to form a possession for himself, a patrimony for his children, and where he fancies that a brighter landscape greets his eye and a sweeter music carols in his ear than anywhere on earth besides. And thus he learns to love the country to which his fortunes must forever cling. As the roots of a tree derive their nourishment, so the foundations of society derive their strength, from the culture of the soil. It was her devotion to agricultural pursuits that rendered Poland so glorious in her struggle against tyranny—so deeply imbued with the spirit of freedom that the whole civilized world grew sympathetic in her cause, until the very name of Pole, whether applied to those who chafed at home under the thrall of despotism or those who were sorrowing abroad in exile, became a symbol of the love of country. But the influence of agriculture stops not here. With its promotion comes a consequent decrease of crime. Not in the quiet homes of husbandry which dot the hillside and the plain; not where the farmer's broad domain invites to daily toil and sweet repose; not where the valleys sport and glow with the rich plumage of the nodding grain, does guilt abide or skulk or dare to show its face, but in the crowded dens and poisoned haunts of the corrupted city, where misery and vice hold carnival, and all which greets the eye or sense attests the truth of the quaint maxim that "God made the country, but made the town." No. The spread of farms is fatal to the growth of penitentiaries.

It is equally a noticeable and a gratifying fact that in California, a men gradually lost those vagrant habits and turbulent propensities which pertained to their earlier condition, no longer devoting themselves exclusively to the precarious pursuit of gold, but settling down into the more regular avocation and industrial employments of cultivated life, the taste for agriculture has progressively increased and a higher tone of morals has succeeded. And still this tide of progress rolls along in ceaseless flow, like the tremendous march of ocean. For the first age of California was not an age of gold, though gold was the sole object of its energetic search. That was an age of iron. The old order of the ages was reversed, and the golden age of California, succeeding the age of iron and the age of brass, was destined to come last. It came when men had learned to realize that the true gold for which they were to labor was not that which glittered in the bowels of the earth, whose search corrupted, whose attainment planted in insane asylums those who sought it, but

rather that more precious gold which waved amid the yellow corn and spread its splendor on the tasselled grain.

From these broad general views let us now turn our attention to the more practical questions which affect the agricultural prospects and conditions of our State, and of which your society is the protector, patron and exponent.

This fertile, spreading valley of the Sacramento and its extensive tributary waters, embracing an area so vast, a soil so rich, a productiveness so marvellous, that it seems to have been created in nature's sunniest mood; this opulent expanse of glebe which centuries have fattened, lying open to the reach of all who covet its possession, and giving forth its liberal increase so glibly as to often yield spontaneous growth, has now become the field and the incentive for the welcome toil of tillage and of culture. Stimulated by such powerful inducements, agriculture is constantly acquiring an increased extension and importance in spite of the meagerness of our populational increase, and, in the proportion of its own enlargement, has aided in promoting stability and order; has improved the moral standard; has prompted a larger disclosure, a more abundant use of our resources, with an added dependence upon them for our support. When first the tide of immigration to these shores set in, it brought hither an adventurous multitude, lured by the quest of gold, who, in the ardor and exclusiveness of that pursuit and the newness of the country, were compelled to derive from foreign sources, in large profusion and at great expense, whatever ministered to their maintenance or comfort, including all varieties of merchandise and almost all of the supplies of life. Thus the gold, so easily acquired, was no less easily dispersed. It mainly found its way abroad in remittances to the Atlantic States or Europe, and served to pay for those commodities which had collected here, from importation or adventure, in quantities so vast that their transmission kept the harbor of San Francisco, through all the changes of continuous arrival and departure, filled with a large fleet of merchant ships. Those who were fortunate enough to have acquired more than they spent, having no intention and entertaining no desire to permanently settle in a region which they had only casually visited for a temporary purpose, either sent or took abroad the fortunes they amassed. Some left the country after achieving the transient object of their visit, some sent their earnings elsewhere to support their needy families at home.

So, from a twofold cause, the reckless expenditure of the improvident and the provision of the frugal for external obligations, there began and long continued an exhausting drain upon the treasure of the country. And thus arose that system of voluntary spoliation, which, while it left us poor, made others from our substance rich. When the prophet exclaimed, "My leanness, O my leanness!" he did not even hint it as a requisition of his faith that he should surrender his corpulency to make others fat. Millions upon millions of gold and silver, almost beyond the reach of computation, drawn from the very entrails of our soil and straightway sent abroad, have left this State in indigence, while they have filled New York with palaces and largely added to the riches of the world. In the construction of that choicest of all dainties, the "*pate de fois gras*," the goose is placed within a heated chamber and its thirst, thereby excited, is denied indulgence. And so its liver preternaturally grows while the bird itself keeps fading, fading, till it dies. Taken from its body, this exaggerated liver furnishes that substance from which the

rarest of delicacies come. So it has been with California, helpless bird. Not content with stripping all her feathers, the stranger has absorbed her vitals too. And while her life has pined away in swelling up her yield of gold, even that has been taken from her to pamper and to fatten epicures abroad. It is plain, therefore, that the mines have been no source of wealth or increase to the State. To the rapid progress made in the extension of agriculture and of manufactures, and to that alone does it belong, that we are daily enlarging and growing more dependent on our own resources, while we are steadily decreasing our dependence on external aid. Against this influence, so largely promotive of the common weal, the mines have been persistently arrayed, and even now are, in no small degree, antagonistic. I venture to assert that if you could obliterate the mines and give exclusive care to agriculture and mechanical pursuits, you would materially benefit the State.

It has been said that it takes a gold mine to work a silver mine; but the past history of California proves, by the bitter sanction of experience, that it takes both of these to impoverish a people. And yet, as fire is a good servant but a bad master, so our mining operations, though they have heretofore exercised such a fatal influence on our prosperity, may still be rendered useful if kept in strict subordination to our higher interests and employed as a means of concentrating capital within the State to develop its resources. Let the streams of wealth from our Pactolus of the golden sands no longer flow beyond the realm in which they rise. Let our treasure stay to bless the land out of whose bowels it is dug. If those who are affluent will employ their wealth at home to promote our own domestic interests; if those of slender means will lodge their earnings in the savings banks, or any of our institutions for investment, we may anticipate for California a future as prosperous as her past has been disastrous. But never will we prosper as a people until we reverse the former rule and become producers rather than consumers. Then, and then only, will commerce minister to our advantage when, having supplied from within our domestic wants, it shall turn the vast surplus of our resources into the material of foreign export. Then, and not till then, will we realize the dream so fondly cherished and the picture so vividly drawn by our earlier eulogists and orators of California's coming greatness and renown.

The rapidly increasing magnitude and importance of agriculture are beginning to demand an application of scientific principles to its pursuit. Hitherto, in his earnest struggles for transient success, the agriculturist has labored only to secure from the tillage of his land its largest temporary yield. An exuberant soil, which has been fattening for ages and rendered productive far beyond that of the older settlements with which our people were familiar, has been in many places taxed for years to its utmost capacity without relaxation, change of crop or application of fertilizing matter. What wonder that in the course of time it should become less vigorous and give forth less satisfactory returns. Complaints of a diminished yield unto the acre are multiplying here and there, so that the principle of rotation of crops will soon require to be adopted. It is high time, after the fluctuations and unsettled habits of the past have subsided into the existing quietude, that our farmers should not merely seek for present gain, but wisely make provision for the future, though it involves the inconvenience of temporary loss. "The theory of rotation of crops," says a recent writer, "is based upon the fact that constantly growing the same produce exhausts particular elements in the soil. The soil is robbed of its nutritious qualities, year after year no

new supply is furnished, and out of nothing nothing comes." Even at the present cost of profit the crops must be varied by our farmers, the ground must be manured or suffered to lie fallow for a season, and the farm, parcelled into a variety of fields, must be so managed and modelled as to preserve from year to year a permanent uniformity of yield. It is to be regretted that in many of our counties those old and noble forest trees which are the growth of centuries are slowly disappearing, not alone from the visitations of the woodman's axe, but from the ravage of decay, leaving none of younger date, no scions of advancing growth to fill their places. If these must fade away and cannot be restored, while to the lovers of the beautiful the loss is irreparable, it suggests at least that something can be done to stop this breach in nature by planting shade and ornamental trees, whose growth will either benefit ourselves or those who follow us. It has been aptly said that he who plants an acorn with the benevolent design that, though his eyes will never gaze upon the oak it rears, yet his posterity will rest beneath its shade, has not entirely lived in vain. To every man who treads this soil, who believes in God and cherishes a future hope, whose desires possess a horizon wider than the boundary of self, and who commands the opportunity, we say, in reverent spirit, "Go and do thou likewise."

California is a remarkable and a peculiar State. Stretching from north to south through a sweep of latitude embracing ten degrees; spread out between a chain of mountains and the sea; sentinelled upon the east by giant cliffs, and on the west soothed by the ceaseless murmurings of ocean, its rugged form presents the rarest features of the wonderful and picturesque. Where, in the wide circuit of the globe, does the tourist find a grander spectacle than the majestic elevation of Mount Shasta, the vast gorges of Yosemite, the Geysers with their frightful chasms and preternatural uproar, the colossal forms of the Big Trees of Calaveras, or the glittering splendor of the Alabaster Cave? Within its strange diversity of soil and climate it seems to embrace the qualities of every zone. Beneath its surface lurks the costliest store of minerals and precious metals, while through its forests, skies and waters range all varieties of game, from the huge grizzly to the hare; from the wild turkey to the plover; from the salmon to the mountain trout. It rears the frigid pine and blooms with the magnolia. Its gardens and orchards teem with fruit—whether it be the hardy apple or the delicate pomegranate, the quince or the orange, the peach or the banana, the cherry or the fig. From its prolific soil comes every form of vegetable life down to truffles, artichokes and mushrooms. Nowhere else, within the limits of a single State, do such profusion and variety appear—nowhere else can such rare contrasts be enjoyed. To these natural advantages our agriculturists are gradually adding all that can be attained by enterprise and cultivation. In the stock department a constant improvement is going on, as the display presented at this Fair and those which have preceded it bears ample witness. The free employment of capital in the importation of the choicest breeds and the best blood of stock and cattle has already procured for us the swine of Berkshire, the bulls of Durham, the cows of Devonshire, and Southdown and Merino sheep. For these enormous sums have been expended, and by their employment in the breeding of our native stock its quality sustains an annual improvement. It only needs the scenes this Fair presents to show that some of our horses are derived from the purest blood of either continent. To stimulate and encourage the wonderful propensity of our people for the enjoyments of

the turf, that feature which gives to every Fair its chiefest interest and zest, I need only point to Job's description of the war horse:

"Hast thou given the horse strength? Hast thou clothed his neck with thunder? Canst thou make him afraid as a grasshopper? The glory of his nostrils is terrible. He paweth in the valley and rejoiceth in his strength; he goeth on to meet the armed men. He mocketh at fear and is not affrighted; neither turneth he backward for the sword. The quiver rattleth against him, the glittering spear and the shield. He swalloweth the ground with fierceness and rage; neither believeth he that it is the sound of the trumpet. He saith among the trumpets, ha, ha; and he smelleth the battle afar off, the thunder of the captains and the shouting."

Even now the eyes of this equestrian array here brought together are flashing and their impatient hoofs pawing the ground with the consciousness of coming contests and of victory. And soon in majesty more awful still will there come bounding o'er the Plains the iron horse, snorting fire from his nostrils and waking the echoes of the continent with his fierce roar; aye, soon will he scatter distance to the winds and hie to this emporium as a symbol of power and a harbinger of progress.

By the peculiar structure of the country, which produces periodic inundations of the valley lands, we have learned, through the severe experience of former years, that our cattle have been subject to the most disastrous visitations, perishing by thousands from drowning or starvation. It is proper that the attention of scientific men, both farmers and mechanics, should be more carefully directed to this subject in order that some means be devised to mitigate, if not entirely overcome, the evil.

Among all the divisions of the agricultural department it is safe to say the culture of the vine stands foremost. Of our entire resources, without exception, this will ultimately prove most valuable, and its future magnitude is quite beyond the reach of calculation. The extraordinary adaptation of California for the cultivation of the grape arises from the geniality of the climate, the irregularity of the surface and the fertility of the soil. No other single state upon the surface of the globe exhibits such a vast expanse of territory undulating in hills and valleys. And these through an extent of hundreds of miles are formed so as to present precisely that exposure which is demanded to give flavor to the grape. Although this department is still in its infancy, yet we are discarding all the exaggerations of the press and speaking within reasonable bounds when we rate our present annual yield of wine at upward of a million and a half of gallons, while the number of young vines already planted and hastening on to their maturity is incredible. When we consider that the extent of land suitable and rapidly coming into use for wine growing is greater, as has been authoritatively stated, than all the grape-producing area of Europe, and reflect that three hundred thousand vines and upward may sometimes be found in a single vineyard, we are lost in the magnitude of the subject. Notwithstanding the recent origin of our wine manufacture, the evidence is multiplying around us that wherever it is prepared by experts who are skillful and experienced, and the grapes are taken from a good location, our wine bears favorable comparison with the products of many of the European vineyards. It now enjoys a higher reputation and more just appreciation abroad than at home; in New York than in San Francisco. Every

year's experience will improve its mode of manufacture and the quality of grape from which it is produced, besides imparting to it, before long, the indispensable character of age.

Already do our wines comprise a valuable source of export, finding their way in limited but choice supplies to every market of the globe. And when we contemplate the startling fact that many of the old European vineyards are failing and others have quite given out, while the world's demand for this great luxury is constantly increasing, we may well believe that California, with her virgin soil enriched by the accretions of all former time, with her million hills rich in the elements of inexhaustible supply, will finally supplant the effete soils of Europe and become the vineyard of the world. Even the knowledge of our great productiveness and the prospective choiceness of our wines has not yet reached the apprehension of the epicures of London or Vienna, but the time will surely come when the former rule will mainly be reversed and the homage paid so long unto the wines of Europe will be repaid by Europe to our own. It must be so, because our soil, our climate, our formation, all conspire to prove that we can soon produce the richest qualities of grape, and in such copious profusion that we shall never need to quicken our supply, as Europe does, by deleterious aids, but shall be always able to make our production the unadulterated, pure juice of the grape. Another and not unimportant consequence arising from the cultivation of the grape is that the use of wine as an article of home consumption is supplanting and decreasing the demand for ardent spirits. Our earlier wines were strong and heady, but more recent manufacture has rendered them comparatively light and harmless. As stimulants in some form seem to be an indispensable requirement among every people, that form which is most innocuous is best promotive of the public welfare. It has been observed that wherever the vine is cultivated throughout Europe the use of wine becomes general among all classes, and especially among the yeomanry, to the exclusion of more harmful stimulants. And surely, with the facilities which we enjoy for producing the choicest effusions of the grape, we may hope ere long to see King Alcohol dethroned among our people and his reign subverted by the milder products of our own domestic vintage.

Of the three great kingdoms of production, agriculture had the earliest origin, and after that came manufactures and then commerce. The first dates back to the Adamitic era, the second to the period of Tubal Cain, while the last owes its inception to the enterprise of Tyre. That genius for invention which constitutes the spirit of the age has given unto manufactures a commanding prominence. And yet among all the wonders of modern invention and discovery we find nothing to surpass those stupendous achievements of human ingenuity and skill which belong unto the ancient world. What though we can flash thought round the globe by electricity and span the earth with steam, yet, with all our progress, we cannot rear a pyramid, or carve a Sphynx, or build an Appian Way. What combinations of skill and labor have been able to restore those lost arts which produced the bronzes and the coins of Greece and Rome, the Tyrian purple, the Corinthian brass, or the vases of Etruria? Who shall equal or revive the hanging gardens of Babylon, the Colossus of Rhodes, or the Temple of Diana? In this sharp contrast and rivalled grandeur of the old and new, there exists the cardinal distinction that what man's genius wrought in ancient times was wonderful but abstract; what it now contrives is marvellous but useful.

A practical utilitarian design gives bent unto the thought and industry of the existing generation.

In California the retarded progress of the manufacturing interest has not been owing to an imperfect sense of its importance or to a deficiency in the industry or inventive talent of the people. In no other country does there exist a more profound skill for contrivance or a more unremitting devotion unto labor. As a tribute to our invention, frequent patents are finding their way hither from the Patent Office at Washington. Although it is a popular conviction that the promotion of manufactures is largely essential to our prosperity, yet two causes have combined to interfere with this great interest—the scarcity of operatives and the high price of laber. Indeed, for years and weary years that slow increase, that almost absolute stand still of population, which resulted from the double influence of a diminished immigration from abroad and a continued emigration from within, has retarded the advancement and almost paralyzed the energies of the State. How fortunate the reaction which is now going on—a reaction which has stimulated into new life the enterprise of the people and produced an effect so palpable that what was recently almost a retrograde has again become a forward movement in affairs.

Again, in the improved condition of the country, the population is enlarging, while the wages of labor are decreasing to that standard which political economy prescribes. With these advantages, with the possession of a territory whose formation and peculiarities present the greatest facilities for employing water power and conducting every mode of manufacture, with the increased attention of the operative and the capitalist directed to this valuable interest, with the growing conviction of the instability and harmful tendencies of mining enterprises, what is there to prevent us from taking an early stand among manufacturing communities and sharing the important benefits which they confer upon the citizen and State? Under the embarrassments heretofore existing it is surprising what strides we have already made toward success. It is true, that beyond the quartz and grist mills, which are scattered through the State, the great mass of our manufactures and manufacturing investments of capital and labor is limited to the large cities, and chiefly unto San Francisco. But so much money is invested, so much industry employed, so much material created and such valuable fabrics wrought in this department, notwithstanding past impediments, that it now has the most complete assurance of success. Many a city, town and village which at first strove for commercial consequence, and then struggled through the sickly influence of failure and decline, will be relieved; and by its conversion into an emporium of manufactures, will become a prosperous mart of the surrounding districts. Even the checkered fortunes of this city, the Capital of the State, so long the victim of disaster from the ravages of fire and flood, might be repaired and her lost influence restored by turning in beneath her streets the waters of that river which has so often rolled above them, until what was once a scourge is converted to a blessing, sounding its praises in the music of the frequent water wheel.

This view of our condition as a manufacturing people, however strong the contrast between what we have done and what we can accomplish, does not disparage our past efforts nor undervalue the extent of manufactures at the present time. In the recent annual report of this society, it is correctly stated that "leather of the various kinds, boots and shoes, harness, saddles, whips, every description of cordage, building materials,

granite, marble, lime, plaster, cement, wagons and carriages; railroad, passenger and freight cars; woollen goods, such as blankets of all kinds, flannels of every description; cloths and cassimeres, carpets; hats, caps and various kinds of clothing; glue, asphaltum, gunpowder, matches, tar, pitch, resin, mineral paint, spirits of turpentine, salt, soap, yeast powders, starch, vinegar, pickles, every variety of preserved fruits, jams, raisins, figs, maccaroni and vermicelli, castor oil, petroleum; wines, brandies and the various kinds of spirituous and malt liquors; paper of every variety; glass bottles of every kind demanded, earthern and stone ware, wood, tin and wire ware; mining, mill and steamboat machinery, and machinery of every kind in use; agricultural implements, and various other articles, are manufactured in the State, with greater or less success; very many in sufficient quantities to supply the home demand and keep up a good and remunerative export trade, while others are struggling against the persevering competition of importation."

And this compendious statement, comprehensive as it is, gives but a glimpse of the reality. California is a paradox of production. In the strange antithesis which its versatility involves, we find grouped together within the limits of a single State the shot-tower and the cotton mill, the silk factory and the rope-walk, the refinery of sugar and the powder mill, foundries of iron and manufactories of wood, glass works and oil works; here an inceptive establishment for smelting copper, and there a paper mill; here a tannery and there an arastra. But if we are struck by this contrast and gratified by this variety, our admiration is enhanced by the consciousness that all, or mainly all, of the material which furnishes these institutions with their staple of supply is derived from our own soil, and that our native products have but begun as yet to find the means of their conversions into manufactures. Already we number in the State about three hundred quartz mills, one hundred and thirty grist mills, two hundred and eighty saw mills and forty iron foundries. In the manufacturing department of our industry, measured by the statistics of eighteen hundred and sixty, the number of establishments was three thousand five hundred and five; the capital invested, twenty-four million dollars; the value of the raw material, sixteen million five hundred thousand dollars; the number of operatives employed, twenty-four thousand; and the value of the annual product of manufactures for that year, about sixty million dollars. To these figures we may add an increase for the present year of nearly fifty per cent., which will cause our annual product to approximate a value of one hundred millions.

You will pardon me, gentlemen of the Agricultural Society, for this brief introduction of statistics, but I could not feel that my duty was discharged to you and to the State if I did not thus pointedly, and with the force of demonstration, direct the attention of our citizens to the extensive improvements we have made in developing our resources and turning them into the fabrics and commodities of manufacture. Nothing now remains but to further improve our opportunities and increase our population. Manifold are the influences which combine to facilitate this consummation. As it rolls along, the car of progress gathers swifter motion from its own momentum. The termination of a long and sanguinary civil strife, which only strengthened the fabric it struggled to subvert; the multitudes now drifted by the tides of war into the channels of employment and forced on the necessity of labor; the great trans-continental railroad, which will soon reach our borders, spreading from shore to shore and binding the nation with a band of iron; and above all, the inviting occupations, salubrious climate and teeming

abundance of this coast, will combine to attract hither a larger flow of immigration than we have ever known before. Christianity and civilization, those twin sisters of a birth divine, starting from the point where Eden bloomed, have been moving hand in hand together all through the ages and all round the globe unto the utmost reaches of the West. And here to-day we greet them with glad voices and with loving eyes. When Jacob, gazing eastward for the Orient, declared that his blessings should prevail "unto the utmost bound of the everlasting hills," what other boundary of earth could he have thus foreshadowed than this fair land, whose rugged peaks fringe the Pacific's shore. That blessing, never failing, though pronounced so long ago, was designed to find its latest lodgment here, as the remotest point in stretch of distance and in lapse of time. Here at this western margin of the globe, our pioneers have come into a heritage which rivals the prophet's picture of the land of promise; "a land of brooks, of water, of fountains and depths that spring out of valleys and hills; a land of wheat and barley, and vines, and fig trees, and pomegranates; a land of oil, olive and honey; a land wherein thou shalt eat bread without scarceness—thou shalt not lack anything in it; a land whose stones are iron, and out of whose hills thou mayest dig brass." Nor is this all. For California was no less the offspring of political necessity than of divine appointment. By a wonderful analogy the destiny of nations has followed that same law which ruled among the chosen people. And when the poet said,

"Westward the star of empire takes its way,"

his words were no less a delineation of the past than a prediction of the future. Yes, ever and forever westward has that star moved on from its first rising in the east. Asia beheld its earliest light when it illumed the pride of Babylon and Nineveh and the kingdom of Darius. Europe next grew radiant in its beams when it gleamed on the night of Greece and Rome, and bathed the modern Powers in its rich effulgence. Yet still it glided on to pour its latest splendor down upon America with a pervading glory that kept ever spreading on across the continent until it fell on California, the empire of the West, the land where grows the olive and the vine, where sounds the anvil and the loom, where shines the silver and the gold, whose wide extended sway, broad as the elements, controls the wave with Neptune's trident, the fire with Vulcan's hammer, the air with the caduceus of Mercury, and the earth with Ceres' teeming horn.

O, California, prodigal of gold,
Rich in the treasures of a wealth untold,
Not in thy bosom's secret store alone
Is all the wonder of thy greatness shown.
Within thy confines, happily combined,
The wealth of nature and the might of mind,
A wisdom eminent, a virtue sage,
Give loftier spirit to a sordid age.

SYNOPSIS OF AN ADDRESS ON CHINESE AGRICULTURE.

DELIVERED BEFORE THE STATE AGRICULTURAL SOCIETY, SEPTEMBER 13, 1866.

BY DR. D. J. MACGOWAN.

Dr. MACGOWAN spoke, in substance, as follows: Among the honors that it had been his good fortune to obtain in travelling round the world was that of delegate from the California Agricultural Society to China. He was not an orator nor a practical agriculturist, and could only deliver a plain narrative, hoping that the desultory and superficial character of his remarks would be kindly overlooked. He had spent about seventeen years in China, and would confine his address to that colossal and teeming empire. China embraced such a large portion of the earth's surface that there were presented every variety of soil and climate, and its botany and agriculture presented every aspect that could be met with on the globe, while some of her fields had been under cultivation for between forty and fifty centuries. In its topography it resembled this State, the pride of the Union. As he had once remarked, if he were bound on a journey to other planets and other planetary systems, he would wish to clip off California and take it with him as a specimen of the sort of world from which he hailed. One of the most remarkable characteristics of the people of China was the high position which they assigned to agriculture, and the regard that was entertained for tillers of the soil. Divine honors were paid to Shin Nung, an early Emperor, who was their reputed initiator in agriculture, and the most remarkable ceremony of this most ceremonious people served to illustrate their conception of the importance of agriculture. At the vernal equinox the Emperor in person, after paying his devotions to the celestial and terrestrial gods, laid hold of a plough and turned over a portion of a field, thus paying royal honors to the farmer's vocation. No foreigner had been allowed to witness the imperial ceremony, but on the same day the Viceroys, Governors, Intendants, prophets and district magistrates, each in their respect-

ive places of rule, performed the same ceremony, which he had often witnessed.

The Chinaman's word for food was rice, that being their staff of life, and the morning salutation of the millions there was invariably, "Have you swallowed rice?" Nevertheless, this staple was not cultivated everywhere; its source of cultivation laid south of the Yellow River, north of which place wheat, millet, buckwheat and barley were grown. The varieties of this cereal were very numerous; the chief divisions were into white, red and glutinous, some or all of which were well adapted to our tule lands. The day might be remote, but would surely come, when these lands would prove the richest in this the richest of agricultural States. With nothing like the expense at which Holland had been at in constructing dikes, our children would reclaim these waste places, which would no longer disfigure our valleys, but twice a year be verdant and as often golden with a cereal sufficient for the supply of the whole Pacific coast.

These paludal districts of yours would prove valuable, also, for the cultivation of the mat grass. The matting which the Chinese make from this article was highly prized in commerce, and if introduced here would give rise to a new and valuable form of industry.

Perhaps next to rice culture in China was the silk culture. Prevost had an exhibition in the Hall which showed that this form of industry was destined to take a high place in California. Chinese writers on silk culture laid down many rules for success. Some of the most frivolous of these even contained useful hints. There must be no noise or strong odors in the building where the worms are kept. Loud talking was forbidden, and some writers even went so far as to say that impure connection was detrimental to the spinners of the last cocoons. The women carried the eggs in their bosoms by day and placed them under their pillows at night, as indeed was the practice of Europeans for a long time. As sheep were largely raised in this State, he would say that mulberry leaves gave a flavor to mutton which no other food could.

What is called green manuring, which is of comparatively modern origin in Europe, the Chinese have resorted to from time immemorial. They regularly sow and plough in clover for restoring the soil. To show the extent to which they utilized refuse for the purpose of manuring, he would mention that the barbers carefully preserved the hair which every ten days or so they shaved from millions of scalps, to sell for manuring those lands which required a small addition of silica.

As the mulberry flourished on this side of the Pacific, so there were, no doubt, many other trees, both ornamental and useful, which might take root in our valleys and on our mountain acclivities. The tallow tree would grow in any part of California; in fact, it had been introduced long ago into South Carolina. In these days of petroleum it might not, perchance, be in demand for the tallow it yields, but the requirements of manufacture were so varied that the peculiar character of this article was likely to be utilized for purposes which other illuminating or oleaginous materials might fail to meet. Experiments had been made in this country, in India and elsewhere to obtain tallow from this tree, but in vain; nothing could be had but a semi-fluid product, half oil and half tallow. It was abandoned some years ago. The Agricultural and Horticultural Society of Bengal addressed him on the subject, and at their request he investigated and found that by one process the Chinese removed the outside of the seed, procuring solid tallow, and by a subsequent procedure they obtained an oil. The above society had also

requested him to investigate another subject of agricultural interest. The well known article, grass cloth, which resembled linen, was not the product of a species of hemp, but was made from the Nhea Ninea. The plant could be readily cultivated here, but it would not be profitable until a method was devised for separating the fibrous portion from the stem. It was because this was done by the fingers of women and children that the cloth was expensive.

The Chinese had not much to teach us in the cultivation of fruits, yet there were many that might be advantageously introduced here.

He would not say much about that source of wealth to China, the tea plant, although he had resided in a district in which that valuable shrub was extensively cultivated, because he would content himself mainly with allusions to those articles which could be successfully acclimated in this State. In one sense it could be, but not as an article from which profit could be derived. The article could only be raised where labor was far cheaper than it was in any part of the United States. As an illustration of the cheapness of labor in China, and the painstaking character of its people, he might state that he had seen women occupied in picking off the almost microscopic aphides which infested their cabbages.

In the cultivation of garden vegetables the Chinese were remarkably successful, and some of their products and processes were worthy the attention of the members of the California Agricultural Society. There was a cabbage grown there which he would like to see tried in the northern part of this State and Oregon; and there were places in the southern portion of this State which ought to attempt the introduction of members of the citron family, particularly certain kinds of small oranges.

No sooner were the walls of Chinese exclusion thrown down than several foreign countries sent delegates to China to gather information that might conduce to their agricultural and industrial interests. Believing that our country, from its vast extent and varied adaptability, could not but be benefited by enterprises of a like kind, he had submitted the matter, on his return from China, to various agricultural and scientific associations, Chambers of Commerce, etc. With one voice they concurred in recommending a proposition to Congress that a Commission of practical agricultural and scientific men should be sent to China and neighboring countries to gather information, examine peculiar processes, and collect seeds and plants for transmission to parties in the United States, from Maine to Texas, and to translate from Chinese agricultural writers the results of ages of observation in their art. He was happy to state that the public men in Washington, and notably Senator Cole and Representative Higby, accorded the project their support. The Committee on Agriculture made a favorable report; and he was satisfied that if time had permitted, the plan, perhaps in a modified form, would have been adopted.

It might be that Eastern Asia would not present us with another gift as valuable as sorghum, nor one that would compare with the present which this hemisphere presented to the Old World in the potato, but that there is much to be gleaned there, could not be doubted.

In conclusion, he would say that, should he happily become the instrument of introducing into California a single new plant useful or ornamental, he would feel more than compensated for all his labors.

TRIALS OF SPEED IN 1866.

MONDAY, SEPTEMBER 10TH.

FIRST TRIAL.—*Trotting race*—Mile heats; three in five; to harness; free for all stallions; purse—four hundred dollars.

Judges: Robert Beck, R. C. Beattie and S. B. Whipple.

Entries—J. B. Gallar entered b. h. Latham.
C. H. Shear entered g. h. Captain Hanford.
Peter Gamble entered b. h. Bellfounder.

Result—Latham	1	1	1
Hanford	2	2	2
Bellfounder	3	3	dis

Time—First heat—2:35; second heat—2:34; third heat—2:34½.

SAME DAY.

SECOND TRIAL.—*Pacing race*—Mile heats; three in five; to harness; purse—two hundred and fifty dollars.

Judges: Robert Beck, R. C. Beattie and S. B. Whipple.

Entries—G. W. Gilbert entered g. m. Queen of the Pacific.
E. M. Skaggs entered b. g. Dick Gough.
Peter Gamble entered g. m. Unknown.
Barney Rice entered b. g. Young America.
A. F. Smith entered b. g. Mike O'Brien.

Result—Young America	1	1	1
Queen of Pacific	2	2	3
Mike O'Brien	3	5	dis
Unknown	4	3	4
Dick Gough	5	4	2

Time—First heat—2:36; second heat—2:37¼; third heat—2:36½.

TUESDAY, SEPTEMBER 11TH.

FIRST TRIAL.—*Running race*—Two mile heats; purse—four hundred dollars.

Judges: James A. Douglass, Nathan Coombs and G. W. Werk.
Distance Judge: Theodore Winters.

Entries—Thomas White entered b. h. Pilot.
A. M. Stevenson entered b. m. Versalia.
Leet & Merritt entered s. h. Richmond.

Result—Pilot	1	1
Versalia	2	2
Richmond	3	dis

Time—First heat—3:48; second heat—3:51.

SAME DAY.

SECOND TRIAL.—*Running race*—Mile heats; for three year olds; purse, two hundred and fifty dollars.

Judges: James A. Douglass, Nathan Coombs and G. W. Werk.

Entries—J. E. Tyree entered b. c. Ten Broeck.
F. Depuyster entered c. c. Patrick.
R. T. O'Hanlon entered b. g. Deringer.

Result—Deringer	1	1
Ten Broeck	2	2

Time—First heat—1:48¾; second heat—1:50½.

SAME DAY.

THIRD TRIAL.—*Running race*—Single dash of a mile; for two year olds; purse—two hundred dollars.

Judges: James A. Douglass, Nathan Coombs and G. W. Werk.

Entries—J. S. Barnes entered Nettie Moore.
A. Musick entered Ellen Moore.
D. Hobbs entered Little Lucy.

Result—Nettie Moore	1
Ellen Moore	2

Time—2:01.

WEDNESDAY, SEPTEMBER 12TH.

FIRST TRIAL.—Mile heats; three in five; to harness; free for all trotters and pacers; purse—four hundred dollars.

Judges: N. Coombs, J. M. Duncan and S. Daniels.

Entries—C. H. Osborn entered b. h. Young Lightning.
Barney Rice entered b. g. Young America.
J. B. Gallar entered b. m. May Queen.
Alexander Gamble entered g. m. Unknown.
Charles H. Shear entered g. h. Captain Hanford.

Result—May Queen	1	1	1
Young America	2	2	2
Captain Hanford	3	3	3
Young Lightning	distanced		
Unknown	distanced		

Time—First heat—2:34¼; second heat—2:31¾; third heat—2:32¼.

SAME DAY.

SECOND TRIAL.—*Trotting race*—Three mile heats—for second class trotters; purse—four hundred dollars.

Judges: N. Coombs, J. M. Duncan and S. Daniels.

Entries—Barney Rice entered s. g. Lowry Mathews.
W. Porter entered b. g. Fillmore.
Alexander Gamble entered s. m. Dolly Duncan.

Result—Fillmore	1	1
Lowry Mathews	2	2
Dolly Duncan	distanced	

Time—First heat—8:03½; second heat—8:09¼.

SAME DAY.

THIRD TRIAL.—*Trotting race*—Mile heats; free for all three year olds, except the winner of the great three year old stake for eighteen hundred and sixty-six.

Judges: N. Coombs, J. M. Duncan and S. Daniels.

Entries—Michael Ryan entered b. m. Fanny Dooley.
Harris Covey entered g. m. Maid.
Seneca Daniels entered California Damsel.

Result—Maid	1	1
Fanny Dooley	2	2
California Damsel	3	3

THURSDAY, SEPTEMBER 13TH.

FIRST TRIAL.—*Running race*—Mile heats; three in five; purse—four hundred dollars.

Judges: N. Coombs, J. M. Duncan and H. W. Seale.

Entries—Theodore Winters entered b. g. Lex.
R. T. Leet entered c. m. Flora.
W. H. Tisdale entered b. h. Jim Hawkins.
A. M. Stevenson entered b. g. Shiloh.

Result—				
Shiloh	2	1	1	1
Lex	1	3	3	2
Hawkins	3	2	2	3
Flora	drawn.			

Time—First heat—1:48¼; second heat—1:49; third heat—1:54½; fourth heat—1:55¾.

SAME DAY.

SECOND TRIAL.—*Trotting race*—Mile heats; three in five; to harness; free for all horses that have not shown better time than 2:50.

Judges: N. Coombs, J. M. Duncan and H. W. Seale.

Entries—Pat Farrell entered Dolly Duncan.
C. D. Lusk entered Pat McCune.
Roe Allen entered Roe Allen.

Result—			
Pat McCune	1	1	1
Dolly Duncan	2	3	2
Roe Allen	3	2	3

Time—First heat—2:49½; second heat—2:48; third heat—2:46 1-5.

FRIDAY, SEPTEMBER 14TH.

FIRST TRIAL.—*Trotting race*—For double teams; free for all horses, except May Queen and Honest Ance.

Judges: N. Coombs, J. M. Duncan and H. W. Seale.

Entries—John Daniels entered br. h. and g. h. Latham and Casserly.
C. H. Shear entered b. m. and g. h. Mandeville and Hanford.
Pat Farrell entered s. h. and g. m. Charley and Lady Clinton.

Result—				
Charley and Clinton	1	3	2	2
Hanford and Mandeville	2	2	dis	
Latham and Casserly	3	1	1	1

Time—First heat—2:54¼; second heat—2:53½; third heat—2:50¼.

SAME DAY.

SECOND TRIAL.—*Trotting race*—Mile heats; three in five; to harness; free for all horses that have not shown better time than 2:40.

Judges: N. Coombs, J. M. Duncan and H. W. Seale.

Entries—W. F. Hardy entered r. m. Genoa Maid.
Roe Allen entered w. h. Tempest.
Pat Farrell entered s. h. Grandee.

Result—			
Grandee	1	1	1
Tempest	2		dis.
Genoa Maid	3	2	2

Time—First heat—2:43 1-5; second heat—2:38 2-5; third heat—2:52.

SATURDAY, SEPTEMBER 15TH.

FIRST TRIAL.—*Race*—Five miles out; free for all trotters and pacers; to harness; purse—five hundred dollars.

Entries—A. F. Smith entered b. h. Mike O'Brien.
Alexander Gamble entered g. m. Unknown.
E. M. Skaggs entered b. h. Dick Gough.

Result—	
Dick Gough	1
Mike O'Brien	2
Unknown	3

Time—First heat—2:48; second heat—2:44½; third heat—2:47½; fourth heat—2:42; fifth heat—2:52 3-5=13:54 3-5.

SAME DAY.

SECOND TRIAL.—*Running race*—Three mile heats; purse—five hundred dollars.

Entries—R. T. O'Hanlon entered g. h. Shiloh.
Thomas White entered b. s. Pilot.
John Hall entered b. m. Viola.
Frank Depuyster entered s. m. Susan B. Moore.

Result.—		
Pilot	1	1
Susan B. Moore	2	2

Time—First heat—5:56; second heat—6:10 2-5.

SAME DAY.

Running race—Mile and repeat; for beaten horses; purse—three hundred dollars.

Entries—Theodore Winters entered b. h. Lex.
R. T. Leet entered s. h. Richmond.
W. H. Tisdale entered b. h. Jim Hawkins.

Result—Jim Hawkins	1	1
Lex	2	2

Time—First heat—1:51; second heat—1:55¾.

PREMIUMS ON STOCK.

THOROUGHBRED HORSES.

Exhibitor.	Residence.	Animal.	Premium.
A. M. Stevenson	Solano	Best stallion four years old and over—Shiloh	$50
A. M. Stevenson	Solano	Best stallion two years old—Triune	$30
John Hall	Alameda	Best stallion, one year old and under—Jonathan	$20
L. P. Marshall	Solano	Best mare, four years old and over, with colt—Ellen Jordan and colt.	$50
John Hall	Alameda	Best mare, four years old and over—Peggy Ringgold	$40
Abraham Musick	Sacramento	Best mare, two years old—Ellen Moore	$25
A. M. Stevenson	Solano	Best dam, with not less than four colts—Fannie Harper	$50

HORSES OTHER THAN THOROUGHBRED.

J. G. McCracken	Sacramento	Best stallion. with not less than ten colts—David Hill and family	$75
Charles H. Shear	Sacramento	Best dam, with not less than three colts—Peggie Magee and five colts	$40

GRADED HORSES.

A. T. Leachman	El Dorado	Best stallion, four years old and over—Lexington	$40
Wm. W. Burditt	San Francisco	Best stallion, three years old—Stonewall Jackson	$30
A. T. Leachman	El Dorado	Best stallion, two years old—General Grant	$20
A. Parker	Yuba	Best stallion, one year old—Paul Jones	$15
Joseph Bauquier	Sacramento	Best mare, four years old and over, with colt—Kate and colt	$30
J. D. Barbee	Sutter	Best mare, three years old—Sue Nelson	$20
J. S. Barnes	Sacramento	Best mare, two years old—Nettie Moore	$15

HORSES OF ALL WORK.

Exhibitor.	Residence.	Animal.	Premium.
J. G. McCracken....	Sacramento....	Best stallion four years old and over —David Hill.....	.....$40
J. G. McCracken.....	Sacramento....	Best stallion, two years old—David Hill, Jr.....	.....$20
J. G. McCracken....	Sacramento....	Best stallion, one year old—Comet..	
Francis Graham.....	Sacramento....	Best mare, four years old and over,	.....$15
		with colt—Dolly and colt.....	.....$40
Edward Fouke.....	Yuba	Best mare, four years old and over, —Mary Blane.....	.....$30
G. L. Clark.....	Sacramento....	Best mare, three years old—Maggie	....$20
J. G. McCracken....	Sacramento....	Best mare, two years old—Mary Ann	.....$15
J. G. McCracken....	Sacramento....	Best mare, one year old—Victoria Runyon.....	.....$10

DRAFT HORSES.

H. W. Seale.....	Santa Clara....	Best stallion, four years old and over —Iron Duke.....	.....$30
John S. Wilson.....	Sacramento ...	Best stallion, two years old—Highland Chief...	.....$15
W. C. Myer.....	Jackson County, Oregon.	Best stallion, one year old—Cascades	.....$10
A. H. Cheney.....	Sacramento ...	Best mare, four years old and over, with colt—Betsy.....	....$30
George Linn.....	Napa	Best mare, four years old and over, Nelly.....	.....$25

ROADSTERS.

A. J. Rhoads.....	Sacramento....	Best stallion, four years old and over —General Taylor.....	.....$40
Edward St. Louis...	Yolo...	Best stallion, three years old—Young Black Eagle.....	.....$30
Henry Hyser.....	Sacramento....	Best stallion, two years old—Henry St. Clair.....	.....$20
George W. Jacobs...	Nevada	Best gelding, four years old and over—John Conness.....	.....$30
A. F. Smith.....	Sacramento....	Best mare, four years old and over —Belle.....	.....$30
Michael Ryan.....	San Joaquin....	Best mare, three years old—Fanny Dooly.....	.....$20
C. H. Huffman.....	San Joaquin...	Best matched span carriage horses —William H. Seward and Abraham Lincoln.....	.....$40
Edward Purdy.....	Sacramento....	Best double team—Beck and Vic.....	.....$40
Wm. K. Squires.....	Solano.....	Best saddle horse—Mac.....	.....$15

COLTS.

Exhibitor.	Residence.	Animal.	Premium.
Sullivan Treat	Sacramento	Best horse colt, one year old—Comet	$30
Charles H. Shear		Best sucking horse colt — Camp Union	$20
Marion Biggs	Sacramento	Best mare colt, one year old—Mollie Jackson	$20
Sullivan Treat	Sacramento	Best sucking mare colt—Dash	
W. C. Myer	Jackson County, Oregon.	Best exhibit of not less than six colts owned by one person	$15 $50

SWEEPSTAKES.

A. M. Stevenson	Solano	Best stallion—Shiloh	$100
John Hall	Alameda	Best mare—Peggy Ringgold	$75

JACKS, JENNETS AND MULES.

John M. Laughlin	Sonoma	Best jack—Liberty	$50
Thomas Edwards	Sacramento	Best jennet	$40
Miller & Smith	Sacramento	Best mule, three years old and over—Juliet	$30
Miller & Smith	Sacramento	Best pair of mules—Kate and Mollie	40

DURHAM CATTLE.

John B. Redmond	Marin	Best bull over four years old—Water Prince	$40
John D. Patterson	Alameda	Best bull, two years old—Second Duke of Oak Home	$20
Robert Branton	Solano	Best bull calf—Duke of York	$10
Robert Branton	Solano	Best cow, four years old and over—Pocahontas	$30
Robert Branton	Solano	Best heifer calf—Lady Oxford	$1[illegible]

DEVON CATTLE.

J. R. Rose	Sonoma	Best bull, four years old and over—Napoleon	$40
Seneca Daniels	Sonoma	Best bull, three years old—Medoc	$25
Seneca Daniels	Sonoma	Best bull, two years old—Champion	$20
J. R. Rose	Sonoma	Best bull, one year old—Bloomfield	$15
Seneca Daniels	Sonoma	Best cow, four years old—Fashion	$30
J. R. Rose	Sonoma	Best cow, three years old—Fancy	$25
J. R. Rose	Sonoma	Best cow, two years old—Beauty	$20
Seneca Daniels	Sonoma	Best cow, one year old—Nancy	$15
Seneca Daniels	Sonoma	Best bull calf—Victor	$10
J. R. Rose	Sonoma	Best heifer calf—Annie	$10

AYRSHIRE CATTLE.

Exhibitor.	Residence.	Animal.	Premium.
J. R. Rose	Sonoma	Best bull, four years old—Sir Walter	$40

GRADED CATTLE.

Moses Sprague	Sacramento	Best bull, three years old—Billy	$25
Robert Branton	Solano	Best cow, four years old—Tulip	$30
Wm. H. Brainard	Sacramento	Best cow, three years old—Jessie	$20
Peter Burns	Sacramento	Best cow, one year old—Swan	$10

CATTLE SWEEPSTAKES.

J. B. Redmond	Marin	Best bull—Lalla Rookh	$50
Robert Branton	Solano	Best cow—Pocahontas	$40

SHEEP—SPANISH MERINO.

Thomas Cotter	Sacramento	Best ram, two years old	$20
J. D. Patterson	Alameda	Best ram, one year old	$15
D. D. Satterfield	Sacramento	Best three ram lambs	$15
Thomas McConnell	Sacramento	Best three ewes, two years old	$15
Ellen F. McConnell	Sacramento	Best three ewes, one year old	$15
D. D. Satterfield	Sacramento	Best five ewe lambs	$15

FRENCH MERINO.

J. D. Patterson	Alameda	Best ram, two years old	$20
J. D. Patterson	Alameda	Best three ram lambs	$15
J. D. Patterson	Alameda	Best three ewes, two years old	$15

SPANISH MERINO GRADES.

Ellen F. McConnell	Sacramento	Best ram, two years old	$15
D. D. Satterfield	Sacramento	Best ram, one year old	$10
Richards & Taverner	Sacramento	Best three ram lambs	$15
Francis Graham	Sacramento	Best three ewes, two years old	$10
Thomas Cotter	Sacramento	Best three ewes, one year old	$10
Richards & Taverner	Sacramento	Best five ewe lambs	$10

SWEEPSTAKES.

Exhibitor.	Residence.	Animal.	Premium.
J. D. Patterson	Alameda	Best ram	$25
Ellen F. McConnell.	Sacramento	Best ewe	$20
Ellen F. McConnell.	Sacramento	Best pen of five ewes	$25

SWINE.

A. P. Smith	Sacramento	Best large breed boar, two years old	$15
Peter Burns	Sacramento	Best large breed boar under two years	$10
A. P. Smith	Sacramento	Best small breed sow over six months old	$10
A. P. Smith	Sacramento	Best six small breed pigs over five months old	$20
A. P. Smith	Sacramento	Best small breed boar six months old	$10
A. P. Smith	Sacramento	Best small breed sow one year old	$10
A. P. Smith	Sacramento	Best small breed sow two years old	$10
Robert Branton	Solano	Best large breed sow two years old	$10
Robert Branton	Solano	Best large breed sow one year old	$10
Norman Woodbeck		Best six large breed pigs from five to ten months old	$20

POULTRY.

R. J. Merkley	Sacramento	Best pair full blood Spanish dorkings	$5
R. J. Merkley	Sacramento	Best pair half breed black Spanish dorkings	$5
R. J. Merkley	Sacramento	Best pair turkeys	$5
R. J. Merkley	Sacramento	Best drake	$5
R. J. Merkley	Sacramento	Best lot ducks	$5
R. J. Merkley	Sacramento	Best gander	$5
R. J. Merkley	Sacramento	Best pair geese	$5
R. J. Merkley	Sacramento	Best guinea chickens	$5

MACHINERY, IMPLEMENTS, ETC.

Exhibitor.	Residence.	Article.	Premium.
P. H. Murphy	Sacramento	Best reaper	First—$10
P. H. Murphy	Sacramento	Best display of reaping and mowing machine knives	First—$5
Treadwell & Co	San Francisco.	Best combined reaper and mower	First—$10
Baker & Hamilton	Sacramento	Best assortment of agricultural implements	Special.
Baker & Hamilton	Sacramento	Best mowing machine	First—$10
Baker & Hamilton	Sacramento	Best cultivator	First—$5
Baker & Hamilton	Sacramento	Best ploughs	First—$10
Hill & Knaught	Marysville	Best grain broadcast sowing mach'e	First—$10
Hill & Knaught	Marysville	Best harrow	First—$3

Exhibitor.	Residence.	Article.	Premium.
John Mott	Contra Cos. Co.	Best stubble ploughs	First—$10
John Mott	Contra Cos. Co.	Best sidehill plough	First—$5
B. F. Ready	Sacramento	Best double plough	First—$10
		Best sewing machines for family use —The Florence machine	First—$5
		Best sewing machine for manufacturing purposes—Grover & Baker machine	First—$5
S. W. Preble	San Francisco.	Best knitting machine—Lamb's	First—$5
J. Dickerson	Sutterville	Best windmill (model)	Special.

SILK AND FABRICS MADE FROM CALIFORNIA SILK.

To L. Prevost, for his splendid exhibit of silk cocoons of the French and Japanese varieties, a special premium of diploma and honorary membership of Society. Wilson Flint, I. N. Hoag, John Smith, Madame Sauffaignon, —— Oliver, M. Tiffoinet, G. A. Jones and Captain Haynie are entitled to honorable mention for their efforts in aid of a great enterprise.

For sample of ribbed silk thirty-seven and one half inches wide, California manufacture, being the first ever made in California, also samples of floss, raw tram and organsin silks, a special premium, silver fruit dish and diploma, to Neumann & Meyer, San Francisco.

For best silk cravat, first premium, $5, to Neumann & Meyer, San Francisco.

MILL FABRICS.

W. H. Rector	Brooklyn	Best piece cotton sheeting	First—$3 and diploma.
W. H. Rector	Brooklyn	For sample of California manufactured sewing twine	Special.
J. C. Meyer & Sons	San Francisco.	For the best exhibit of cotton batting and wadding	Special—silver goblet.

NEEDLE, SHELL AND WAX WORK—CLOTHING, HATS, CAPS, ETC.

Mrs. Jane Brooks	Washington	Best wax plant	First—$2
Mary Hurd	Sacramento	Best chenille work	First—$3
Mrs. Chas. Holbrook	Sacramento	Best embroidery with beads	First—$3
Miss Net. Reynolds.	Vacaville	Best leather work	First—$3
Miss Net. Reynolds.	Vacaville	Best tatting work	First—$3
J. C. Meussdorffer	Sacramento	Best exhibit of men's hats and caps	First—$3
Miss L. Klays	Sacramento	Best embroidered picture	First—$3
Mrs. Geo. A. Putnam.	Sacramento	Best ottoman cover	First—$3
Mrs. J. P. Odbert	Cosumnes	Best raised worsted embroidery	First—$3
Mrs. Lyman Wells.	Sacramento	Best embroidered chair seat	First—83
Mrs. Lyman Wells.	Sacramento	Best lamp mat	First—$2
Miss Minnie Tukey.	Sacramento	Best crochet shawl	First—$2
Mrs. W. H. Taylor.	Sacramento	Best silk quilt	First—$3
Mrs. W. H. Taylor.	Sacramento	Best affghan	First—$2
Charles Strobel	Michigan Bluff	Best cone work	First—$3
Mrs. L. P. Lowell	Sacramento	Best worked quilt	First—$3
Mrs. M. S. Lytle	Sacramento	Best wax fruit	First—$2
Mrs. W. W. Marvin	Sacramento	Best white quilt	First—$3
Mrs. E. Blake		Best knit woollen socks	First—$2

STOVES, FURNITURE, ETC.

Exhibitor.	Residence.	Article.	Premium.
Thomas Hansbrow..	Sacramento....	Best cooking stove for wood.....	.....First—$5
Thomas Hansbrow..	Sacramento....	Best cooking range.....	.....First—$5
W. T. Garratt.....	San Francisco.	Best church bell.....	.....First—$3
J. Hopley.....	Sacramento....	Best sofa.....	.....First—$5
J. Hopley.....	Sacramento....	Best lounge.....	.....First—$2
J. Hopley.....	Sacramento....	Best office chair.....	.....First—$2
J. Hopley.....	Sacramento....	Best set of parlor chairs.....	.....First—$5
J. Hopley.....	Sacramento....	Best set of parlor furniture.....	.....First—$10
Hasselgren & Co.....	Sacramento....	Best spring mattress.....	.....First—$5
J. Hopley.....	Sacramento....	Best dressing bureau..	.....First—$5
J. Hopley.....	Sacramento....	Best centre table.....	.....First—$5
J. Hopley.....	Sacramento....	Best display of furniture.....	.....First—$10

MANUFACTURES, ETC.

Antone Menke.....	Sacramento....	Best exhibit of willow ware.....	.....First—$3
P. Kelley.....	San Francisco.	Best dress boots.....	..... First—Diploma.
A. T. Nelson.....	Sacramento....	Best set of Concord harness.....	.....First—$5
G. Carmelich.....	San Francisco.	Best display of saddles and bridles..	.....First—$5
J. E. Parker.....	Sacramento....	Best set of carriage harness.....	.....First—$5
Justin Gates & Bro..	Sacramento....	Best prescription case, with chemicals, etc.....	.....First—$3
D. S. Hutchinson....	San Francisco.	Best specimens of dentistry.....	..... First—Diploma.
L. K. Hammer.....	Sacramento....	Best chronometer.....	..... First—Diploma.
Prof. W. P. Blake...	San Francisco.	Best display of crude petroleum.....	..... First—Diploma.
Hayward, Coleman & Co.....	San Francisco.	Best display of refined petroleum....	..... First—Diploma.
C. F. Travis.....	Sacramento....	Burr stones of California manufacture.....	..... First—Diploma.
M. & A. Wilcox.....	Sacramento....	Best apparatus for raising water for mining purposes.....	.....First—$10
C. H. Harrison.....	San Francisco.	Wrecking pump.....	.....Special
Thomas Hansbrow..	Sacramento....	Best apparatus for raising water for irrigating purposes.....	.....First—$10
J. M. Horner.....	Alameda.....	Best washing machine.....	.....First—$3
I. J. Hattabough.....	Santa Clara....	Best hay pitching machine.	.....First—$3
Goss & Lambard.....	Sacramento....	Best display of brass and iron work	..First—$5 and diploma.
Floberg & Conrad...	Sacramento....	Best display of silverware.....	.....First—$5
I. L. Merrell.....	Sacramento....	Block of asphaltum.....	.....Special—$3
J. Johnson.....	Sacramento....	California marine plants and flowers	.....Special—$3
J. Q. A. Warren.....	San Francisco.	Rare and beautiful collections of pressed fern and flowers; also, flower, shrub, tree and fruit seed, minerals and shells; also, photographs of the royal family of the Sandwich Islands.....	Special, $50, with framed diploma.
S. E. Phelps.....	San Francisco.	Hall's Sicilian hair renewer.....	.....Special—$3
....	.....	Chapman's hair invigorator.....	.... Diploma.
T. Armstrong.....	Sacramento....	Horse collars.....	.....Special—$3
Edwards & Co.....	Sacramento....	Case of assorted stationery, etc.....	.....Special—$3
H. Powers	Alta.....	Scotch dray and team collars.....	.....Special—$3
Mrs. M. S. Reed.....	San Francisco.	Gentlemen's suspenders, shoulder braces and ladies' skirt supporters	.....Special—$3
Bernardo Moreno...	Sacramento....	Saddle stamping.....	.....Special—Diploma.
Ireland & Eldred....	.....	Brooms and matches.....	.....Special—$3
Stoddard.....	San Francisco.	Water filters.....	.....Special—$3
Ochsner & Laauser..	Sacramento....	Wine cask.....	.....Special—$3
I. L. Merrell.....	Sacramento....	Mammoth quartz and double-winged lanterns.....	.....Special—$3

CROCHET AND FANCY WORK.

Exhibitor.	Residence.	Article.	Premium.
Miss Alice Dwinell..	Sacramento....	Tatting work.....	.....Honorable mention.
Mrs. E. Comstock...	Yolo county...	Quilt.....	.....Special—$3
Miss A. E. Morrill...	Sacramento....	Affghan.....	.....Special—$6
Mrs. S. E. Herrick..	Sacramento....	Cone work.....	.....Special—$3
Mrs. H. C. Starr.....	Sacramento....	Affghan.....	.....Honorable mention.
Mrs. Mary Chisman	Sacramento....	Rag rug and cushion.....	.....Special—$3
Mrs. J. P. Odbert...	Cosumnes	Crochet bedspread.....	..... Special—$3
Miss S. C. Marvin...	Sacramento....	Crochet sack.....	..... Special—$3
Miss S. C. Marvin...	Sacramento....	Fine collection of verbenas.....	.....Honorable mention.
Miss J. M. Audran..	Sacramento....	Twenty-two samples crochet work...	..... Special—$3
Mrs. E. G. Holmes..	Sacramento....	Knit tidy.....	.....Special—$3
Mrs. C. A. Hull.....	Sacramento....	Hearth rug.....	.....Honorable mention.
Miss M. M. Cafferty	Folsom.....	Worsted pictures.....	.....Honorable mention.
Miss Clara Henley..	Sacramento....	Crochet, needle and worsted work...	..... Special—$3
Miss Sarah F. Smith	Sacramento....	Tatting work	.....Special—$3
Mrs. J. Chisman.....	Sacramento....	Patchwork chair and footstool.....	.....Special—$5

USEFUL INVENTIONS.

G. W. Cord.....	San Francisco.	Grape crusher.....	....Special—$5
Miners' Foundry....	San Francisco.	Hydraulic hose cover.....	.....Special—$5.
W. H. Devalin.....	Sacramento....	Water and gauge cocks.....	.....Special—$3
J. L. Atkinson.....	.....	Stump extractor.....	.....Honorable mention.
J. L. Atkinson.....	.....	Miles' permutation lock.....	.....Honorable mention.
C. D. Turner.....	San Francisco.	White's thief-detect'g money-drawer	.....:Special—$3
Rudolph & Braun...	San Francisco.	Patent gun lock.....	.....Special—$3
W. C. Bussey.....	San Francisco.	Combination lock.....	.....Special—$3
A. S. Dickinson & Co	San Francisco.	Patent lamps.....	.....Special—$3
Smith & Hildreth...	Dutch Flat.....	Soap root bed mattress.....	.....Special—$3
M. B. Bullard.....	San Francisco.	Petroleum stove.....	.....Special—$3

MACHINE SEWING.

By whom executed.	Manufacturer.	Description of work.	Premium.
Miss J. B. Baker....	Wheeler & Wilson.	Best samples plain stitching, for beauty and evenness of stitch.....	.....Special.
Miss Lizzie Collins..	Florence.....	Best samples plain and ornamental work by machine.....	..... Special.

The Committee decided that both machines should have special premiums; if any difference in premiums was made, the Florence should have the preference, their exhibition containing a greater variety of specimens and embracing both plain and ornamental work.

RIFLES, ETC.

Exhibitor.	Residence.	Article.	Premium.
R. Liddel & Co.....	San Francisco.	Display of rifles and sporting articles	..... Special—$10
J. H. Atkinson	.....	Patent anti-incrustator, bridle, reins and patent rivet for bank vault...	....Special—$5
J. H. Atkinson.....	.....	Hose jacket, washtub, patent door strip, Yale's patent lock for doors and drawers.....	.....Honorable mention.
Griffin & Hays.....	Red Bluff.....	Hay and grain lifter.....	.....Special—$5

AGRICULTURAL PRODUCTS.

W. Grafton.....	Yolo.....	Best two bushels Chile wheat.....	.....First—$10
E. Kirkham.....	Yolo.....	Best two bushels Australian wheat..	.....First—$10
W. Fern.....	Sac. county....	Best barley, not less than one half bushel.....	.....First—$3
W. Fern	Sac. county....	Best sample rye, not less than one half bushel.....	.....First—$3
D. Flint.....	Sac. county....	Best bale of hops, 206 pounds.....	....First
D. L. Perkins.....	Alameda	Best sweet corn.....	.....First—$2
D. L. Perkins.....	Alameda	Best exhibit of garden seeds of California production, not less than twenty-five varieties.....	.....First—$20

PRESERVES, PICKLES, JELLIES, ETC.

Mrs. M. S. Hurd.....	Sacramento....	Best peach jelly.....	.....First—$3
Mrs. M. S. Hurd.....	Sacramento....	Best blackberry jelly.....	.....First—$3
Miss Jennie Dwinell	Sacramento....	Best preserved pears.....	....First—$3
Mrs. R. J. Merkley..	Sacramento....	Best preserved quinces.....	....First—$3
Mrs. R. J. Merkley..	Sacramento....	Best preserved peaches.....	.....First—$3
Mrs. R. J. Merkley..	Sacramento....	Best preserved apples.....	.....First—$3
Mrs. R. J. Merkley..	Sacramento....	Best preserved plums.....	.....First—$3
Mrs. R. J. Merkley..	Sacramento....	Greatest number of varieties and best specimens of preserved fruits, not less than one jar of each.....	.....First—$10
Mrs. W. W. Marvin.	Sacramento....	Best canned tomatoes.....	.....First—$3
Mrs. W. W. Marvin.	Sacramento....	Largest and best variety canned fruit	.....First—$10
A. Bergman.....	Sacramento....	Largest and best variety of pickles..	.....First—$10
A. Bergman.....	Sacramento....	Best pickled onions.....	.....First—$3
A. Bergman..... ...	Sacramento....	Best pickled gherkins.....	.....First—$3
Mrs. J. P. Odbert...	Cosumnes.....	Best apple jelly.....	.....First—$3
Mrs. E. B. Crocker..	Sacramento....	Best preserved quinces.....	.....First—$3
Mrs. E. B. Crocker..	Sacramento....	Best pickled peaches.....	.....First—$3
Mrs. E. B. Crocker..	Sacramento....	Best currant jelly	.....First—$3
Mrs. E. B. Crocker..	Sacramento....	Best quince jelly.....	....First—$3
Mrs. E. B. Crocker..	Sacramento....	Best pickled cucumbers.....	.....First—$3
Mrs. E. B. Crocker..	Sacramento....	Best Siberian crab apple jelly.....	.....First—$3
Miss C. A. Smith....	Sacramento....	Best plum preserves.....	.....First—$3
Miss C. A. Smith....	Sacramento...	Best pear preserves.....	.....First—$3
Mrs. R. Robinson...	Sacramento....	Largest and best variety of jelly.....	.....First—$10
Mrs. R. T. Tiffe.....	Washington ...	Best honey.....	.....First—$5
J. R. Nickerson.....	Lincoln	Best tomato catsup.....	.....First—$3

WINES AND LIQUORS.

Exhibitor.	Residence.	Article.	Premium.
M. Keller	Los Angeles	Best white wine (five years old)	First—$5
C. Detten	Stockton	Best white wine (four years old)	$5
C. Detten	Stockton	Best white wine (three years old)	$5
M. Keller	Los Angeles	White wine (three years old)	Special—$5
M. Keller	Los Angeles	Best white wine (two years old)	$5
C. Detten	Stockton	White wine (two years old)	Special recom'ended—$5
B. N. Bugbey	Sacram'to Co.	Best white wine (one year old) from foreign grapes	$5
William Mace		Best white wine (one year old) from native or Los Angeles grapes	Special recommended
B. N. Bugbey	Sacram'to Co.	White wine (one year old)	Special recommended
F. Horl	Sacramento	White wine (one year old)	Special recommended
L. F. Jarvis		White wine (one year old) from foreign grapes	Special recommended
C. Detten	Stockton	Best red wine (three years old)	$5
L. F. Jarvis		Red wine (three years old)	Special recommended
West Brothers	Stockton	Best red wine (two years old)	$5
M. Keller	Los Angeles	Red wine (two years old)	Special recommended
J. R. Nickerson	Lincoln	Best red wine (one year old), native	$5
B. N. Bugbey	Sacram'to Co.	Best red wine (one year old), foreign	Special recommended
West Brothers	Stockton	Best port wine	$5
B. N. Bugbey	Sacram'to Co.	Best exhibit of wines from foreign grapes	$5
B. N. Bugbey	Sacram'to Co.	Best exhibit of wines from native grapes	$5
B. N. Bugbey	Sacram'to Co.	Best brandy (one year old)	$5
L. D. Lanszweert		Best brandy (two years old)	$5
H. M. Larue	Sacram'to Co.	Best brandy (five years old)	$5

The Committee desired to make special mention of a superior article of brandy of the vintage of eighteen hundred and sixty-six (by an improved process) by Dr. L. D. Lanszweert.

Also, a superb article of peach brandy, by H. M. Larue, Sacramento.

The Committee having tasted of about ninety varieties of wines and brandies, felt fully competent to decide upon the merits of the following articles:

An excellent article of half-and-half, by J. Sajous, San Francisco.

Sarsaparilla and stomach bitters, by J. L. Polhemus; both superior articles. Also, one bottle of distilled water, of which, however, the Committee were unable to "see the point."

Stomach bitters, by A. Fenkhausen, San Francisco, worthy of special mention.

And finally, as a pleasant drink, that will agree with some constitutions, the Committee would highly recommend the soda water made and exhibited by O. Casey, Sacramento.

VEGETABLES, ETC.

A. Runyon	Onisbo	Best yellow onions	First—$1
A. Runyon	Onisbo	Best display of onions	First—$3
A. Runyon	Onisbo	Best six crook-neck squashes	First—$2
J. Smith	Sacramento	Best six tomatoes	First—$2
J. G. Allmond	Sacramento	Best six drum-head cabbages	First—$2
J. G. Allmond	Sacramento	Best six other varieties	First—$2
J. G. Allmond	Sacramento	Best half peck of peppers	First—$1
J. G. Allmond	Sacramento	Best egg plants	First—$2
R. J. Merkley	Sacramento	Best variety of beets	First—$2
R. J. Merkley	Sacramento	Best varieties of potatoes	First—$3
R. J. Merkley	Sacramento	Best carrots	First—$2
R. J. Merkley	Sacramento	Best long blood beets	First—$2
R. J. Merkley	Sacramento	Best turnip beets	First—$2
R. J. Merkley	Sacramento	Best display of beets	First—$3
R. J. Merkley	Sacramento	Best watermelons	First—$2
R. J. Merkley	Sacramento	Best six cucumbers	First—$1

Exhibitor.	Residence.	Article.	Premium.
R. J. Merkley	Sacramento	Best and greatest variety vegetables	First—$10
C. Justis	Bear River	Best sweet potatoes	First—$3
W. Fern	Sacramento	Best half bushel red potatoes	First—$3
W. Fern	Sacramento	Best half bushel of any other variety	First—$3
W. Fern	Sacramento	Best six marrow squashes	First—$2
W. Fern	Sacramento	Best six Hubbard squashes	First—$2
W. Fern	Sacramento	Best display of squashes	First—$4
W. Fern	Sacramento	Best pumpkins	First—$1
W. Fern	Sacramento	Best display of pumpkins	First—$3
J. S. Pond		Best six sugar beets	First—$2
J. S. Pond		Best and greatest variety of melons.	First—$5
A. H. McDonald	Sacramento	One lot of cantaloupes	First—$2

FRUITS.

J. R. Nickerson	Placer	Best forty varieties of apples	$15
A. Runyon	Sacramento	Best twenty varieties of apples	$10
J. G. Allmond	Sacramento	Best twelve varieties of apples	$5
J. R. Nickerson	Placer	Best forty varieties of pears	$15
Daniel Flint	Sacramento	Best twenty varieties of pears	$10
A. Runyon	Sacramento	Best twelve varieties of pears	$5
H. M. Larue	Sacramento	Best twelve varieties of peaches	$5
E. M. Smith	Sacramento	Best six varieties of peaches	$4
O. T. Davis		Best one variety of peach	$2
J. R. Nickerson	Placer	Best twelve varieties of plums	$5
Mrs. Jane Brooks		Best one variety of plum	$3
Mrs. E. B. Crocker	Sacramento	Best one variety of quince	$5
J. R. Nickerson	Placer	Greatest number of native varieties of grapes	$5
E. M. Smith	Sacramento	Best one variety of grapes	$3
J. R. Nickerson	Placer	Greatest number of foreign varieties of grapes	$5
R. B. Woodward	San Francisco	Best seven varieties of grapes—hot house culture	$5
J. R. Nickerson	Placer	Greatest number of varieties of figs	$3
Daniel Flint	Sacramento	Best one variety of figs	$3
J. R. Ketchum		Best one variety of oranges	$3
J. R. Nickerson	Placer	Greatest variety of dried fruits	$20
B. N. Bugbey	Sacramento	Best twenty-four pounds of raisins	$10
J. R. Nickerson	Placer	Best ten pounds of dried prunes	$10
J. G. Allmond	Sacramento	Best native walnuts	$3
E. Pierce	Sacramento	Best soft-shell almonds	$3
J. S. Pond	Sacramento	Best peanuts	$2
Briggs & Haskell		Best dried fruit put up for commerce	$20

PAINTINGS, PHOTOGRAPHS, ETC.

Mrs. J. A. Benton	San Francisco	Best oil painting	$20
John Goode	Sacramento	Specimens of sign and ornamental painting	Diploma.
John Goode	Sacramento	Specimen of fruit painting	Diploma.
E. P. Heald	San Francisco	Specimen of penmanship	Diploma.
J. A. Todd	Sacramento	Pencil drawing	Diploma.
Louis A. Schmidt	aged 10 years	Water color pictures	$3
Ernest M. Schmidt	aged 9 years	Water color pictures	
Alice Schmidt		Tatting work	
J. A. Todd	Sacramento	Water color painting	Diploma.

Exhibitor.	Residence.	Article.	Premium.
John A. Fuller.....	.....	Picture (Freedom's Footsteps).....	..... Diploma.
William Shew.....	San Francisco.	Photograph retouched with India ink.....	..... Diploma.
William Shew.....	San Francisco.	Plain photograph.....	..... Diploma.

The Committee on this department took pleasure in recommending several fine specimens of colored photographs on porcelain, executed by Shew of San Francisco and Todd of Sacramento, for which superb class of pictures no provision appeared to be made on the schedule. The pictures of both artists were more than worthy of honorable mention.

MISCELLANEOUS.

Black & Co.....	Sacramento....	Best pilot bread, best biscuit, best soda biscuit, best butter crackers, best sweet crackers and best Boston crackers.....	..... Diploma.
Black & Co.....	Sacramento....	Best assortment of crackers that has ever come under the Committee's notice.....	..... .Special.
Schroder & Fisher...	Sacramento....	Best case confectionery.....	.....Special—Diploma.
Miss Katy Crocker..	.....	One fruit cake and one sponge cake	.....$1
Mrs. R. J. Merkley..	Sacramento.—	Two loaves bread.....	.....$3
Mrs. E. F. Aiken....	Sacramento....	Ten pounds butter.....	.....First—$10

TRANSACTIONS

OF THE

STATE AGRICULTURAL SOCIETY

FOR

THE YEAR 1867.

FIFTEENTH ANNUAL MEETING.

SACRAMENTO, January 30th, 1868.

In accordance with a call of the Board of Directors, published in the newspapers, the annual meeting of the State Agricultural Society was held on the thirtieth of January, eighteen hundred and sixty-eight, at Agricultural Hall, in Sacramento.

At two o'clock President Reed took the chair and called the meeting to order. He stated the objects of the meeting to be, the presentation of the reports of the officers of the Society, and the election of a President for the ensuing year, and three Directors for the term of three years; that the first thing in order would be the reading of the minutes of the last annual meeting.

On motion, the reading was dispensed with.

The President next stated that the Secretary would read the report of the Board on finance; and afterwards, if the meeting desired, he (the Secretary) would read the report of the Board to the Governor, for their approval or amendment.

On motion, the reading of both reports was dispensed with.

The Secretary was instructed to furnish copies of the report to the Governor, to the Daily Union and the State Capital Reporter, for publication.

COMMITTEE APPOINTED.

On motion, a committee of three, to be appointed by the President, was ordered to examine the books and accounts of the Secretary and Treasurer.

The President appointed E. I. Robinson, C. H. Swift and M. D. Boruck as such committee.

ELECTION OF OFFICERS.

On motion of F. S. Malone, it was resolved that the meeting proceed to the election of President.

The President appointed as tellers Hon. John Kelley of Yolo, Dr. J. F. Montgomery and Hon. Bruce B. Lee of Sacramento.

F. S. Malone placed in nomination for that office the present incumbent, C. F. Reed, Esq., of Yolo.

R. T. Brown put in nomination John H. Carroll of Sacramento.

Mr. Carroll withdrew his name.

Upon a ballot, Mr. Reed received eighty votes; scattering, three.

On motion, the election of Mr. Reed was made unanimous.

Mr. Reed returned his thanks to the meeting for their continued confidence in his management of the duties of the office, and stated that he would in the future, as in the past, endeavor to perform his duty and study the best interests of the Society.

The next business was the election of three Directors.

R. S. Carey of Yolo, H. M. Larue of Sacramento, H. R. Covey of San Francisco, Robert Hamilton of Sacramento, H. D. Dunn of San Francisco and C. W. Reed of Yolo were placed in nomination. A ballot being had, H. R. Covey received eighty-one votes, R. S. Carey eighty votes, H. M. Larue fifty-nine votes, Robert Hamilton forty-four votes, H. D. Dunn six votes and C. W. Reed twenty-seven votes.

H. R. Covey, R. S. Carey and H. M. Larue, having each received a majority of all the votes cast, were declared duly elected Directors for the ensuing three years.

FENCE LAWS.

The President stated that the Secretary had that morning received a communication from the Chamber of Commerce of San Francisco, in reference to certain proceedings of that body at a late meeting, and that if there were no objections the Secretary would read.

The following was then read:

CHAMBER OF COMMERCE OF SAN FRANCISCO, CAL.,
San Francisco, January 29th, 1868.

I. N. HOAG, Esq.,
Secretary State Agricultural Society, Sacramento:

DEAR SIR: At a meeting of this body holden on the twenty-seventh instant, a report on the Fence Laws of this State, strongly urging their repeal, was presented and adopted and ordered published in the Alta California of the twenty-eighth instant, a number of copies whereof I send you herewith.

The Secretary was also instructed to communicate with the State Agricultural Society, calling its attention to the report in question and inviting its co-operation with the Chamber of Commerce in their efforts to procure the repeal of or modification of those laws.

I shall be pleased to receive your acknowledgment hereof and to learn of the action the society may wish to take in the premises.

Very respectfully yours,
C. T. HOPKINS,
Secretary of Chamber of Commerce of San Francisco.

The report referred to in the above letter is as follows:

To the Chamber of Commerce of San Francisco:

Your Committee, appointed at the regular meeting of December tenth, eighteen hundred and sixty-seven, to consider the subject of the Fence Laws now on the statute book of our State, beg leave to report as follows:

The revolution in the political economy of California, occasioned by the addition of thirty millions of dollars and upwards to the fixed capital

of the State, from two years of fair success attending our agricultural interests, has revived among our merchants the recollection that, notwithstanding all that our mines have done for us, agriculture is, nevertheless, the foundation of permanent prosperity in California as well as in every other enlightened community.

At first sight the consideration of Fence Laws may be deemed more appropriate to an Agricultural Society than to a metropolitan Chamber of Commerce. But, when we reflect that commerce is measured by production, this Chamber, as a commercial body, cannot withhold the expression of its opinion on any subject, when that opinion may have any weight in causing legislation to favor increased production.

The lowest condition in which human society exists is the nomadic or savage state, wherein each inhabitant requires several square miles to afford him a precarious living by hunting and fishing. The first step in advance of that primeval condition is when men begin to own flocks and herds, and this is known as the pastoral stage. The cultivation of the soil, combined with the care of domestic animals, marks the third era in the progress of man towards civilization. It seems hardly necessary, in this connection, to do more than allude to the fact that the purely pastoral condition of society can never be classed above a state of semi-civilization, in which a few ignorant and degraded families occupy an immense extent of territory, wherein cultivation must necessarily be exceedingly limited, manufactures confined to those few rude articles which each man makes for himself, and commerce possible only in exchanging hides and tallow for those few foreign products which a semi-civilized state of life requires.

It was a pastoral state of society which we Americans found to exist in California when we took possession of the country. We found about nine hundred families scattered at large intervals, each possessed of land enough to support thousands of industrious cultivators of the soil, which they occupied only as ranges for numerous herds of wild cattle, valuable, not for dairy purposes nor for labor, but only for their hides and tallow. A few Indian vaqueros earned a scanty living in driving these wild animals into the annual rodeos, or in carrying on mantanzas, where their small product was prepared for market. Ignorant of the use of the plough as well as of all the resources and appliances of civilized labor, these primitive settlers could do very little more towards the development of the country than the wild Indians on the plains, while their pre-occupation of all the best lands in the State prevented the settlement and culture by others in their vicinity, except in those few localities where fencing was made possible by the near vicinity of timber, or where proximity to market justified the expense.

It is in the interest of pastoral or semi-civilized life, as opposed to the full development of American civilization, that our present Fence Laws have been enacted.

These statutes compel the farmer who desires to cultivate the lands of this State to pay all the expenses necessary to protect his crops from the ravages of cattle and sheep. The record of these several enactments is dreary enough and sufficiently mixed to puzzle a Philadelphia lawyer, if asked to tell what the law is in any particular county. But as it is necessary to a clear understanding of the subject to know what these laws are, we give the following brief resume.

The original Act, passed March thirtieth, eighteen hundred and fifty, prescribes that in Butte, Amador, Tuolumne, Calaveras, San Diego, Nevada, San Bernardino, Colusa, Placer, Santa Barbara, Yuba, Trinity,

Klamath, Shasta and Siskiyou Counties, the owners of cultivated lands are required to fence the same at their own cost with lawful fences. Failing wherein they are to be punished for killing or wounding stock trespassing thereon. Owners of stock trespassing through lawful fences are obliged to pay simple damages for the first offence, and double damages if the trespass be repeated.

The Act of April, eighteen hundred and fifty-five, provides that in all counties except Amador, Tuolumne, San Diego, San Bernardino, Colusa, Placer, Santa Barbara, Yuba, Trinity, Shasta, Klamath and Siskiyou, certain described fences shall be lawful, and that when a neighbor to inclosed land also incloses, he shall pay half the cost of partition fences, which must be on the line dividing the properties. This Act exempts the counties specified in the Act of eighteen hundred and fifty, and repeals the same, except as to the counties exempted by the Act of eighteen hundred and fifty-five.

The Act of April, eighteen hundred and fifty-eight, applies the provisions of the Act of eighteen hundred and fifty-five to Marin County.

The Act of April third, eighteen hundred and sixty, obliges parties erecting partition fences, when occupied on both sides, to keep said fences in repair.

The Act of April twenty-seventh, eighteen hundred and sixty-one, applies the provisions of the Act of eighteen hundred and sixty to Butte County.

The Act of April first, eighteen hundred and sixty-four, applies the Acts of eighteen hundred and fifty-five and eighteen hundred and sixty-one, to Nevada County.

The Act of March fifth, eighteen hundred and fifty-eight, prescribes lawful fences for Contra Costa County, and inflicts simple damages on cattle owners for the first trespass through lawful fence, and doubles damages for the second offence.

The Act of May, eighteen hundred and sixty-one, prescribes that both parties to a fence between inclosed lots shall contribute equally toward its cost, but also provides that if one party discontinues his inclosure, whatever he may have paid toward the cost of a partition fence shall be refunded by the other party.

The Act of April fifteenth, eighteen hundred and fifty-nine, prescribes what shall be a lawful fence, but is entirely silent as to who shall make it. It punishes the owner of cattle breaking through lawful fences in simple damages for the first offence and double damages for the second; and it gives the right to the sufferer of impounding or seizing the cattle so trespassing, and holding or selling them for the damage if the owner fails to appear. This Act re-enacts the clause in former laws relative to the division of the expense of partition fences, when both parties inclose, not otherwise, and is applied only to San Bernardino, Colusa, Shasta, Tehama and Placer Counties.

The Act of April twentieth, eighteen hundred and sixty-three, prescribes, for Tuolumne County, only the division of the expense of partition fence when both parties inclose, not otherwise.

The Act of March fifteenth, eighteen hundred and sixty-four, whose benefits are confined to a part of Sacramento County, and to Solano, Marin, Butte and Yolo Counties (and which is the only sensible Act on the subject on our statute book), provides that all animals found trespassing, whether on inclosed lands or on those not inclosed, may be detained and sold for the damage they may commit. And this Act

details the method of procedure for the sale of animals so found trespassing.

Reviewing all these Acts we find not only that section eleven of the Constitution of the State of California, which directs that "all laws of a general nature shall have a uniform operation," has been grossly violated by the enactment of no less than thirteen statutes making diverse laws for different counties, but in all of them there has been shown a sublime contempt for that fundamental American idea that every man is entitled to the free use and enjoyment of all property he may be possessed of only so long as that use and enjoyment involves no trespass on the rights of his neighbor. If a cattle owner and a cultivator of wheat happen to be neighbors, who is the aggressor, and who is the sufferer if no lawful fence separate their possessions? Does wheat ever trespass beyond its owner's bounds? Do cattle, horses and sheep do anything else? Then, why should the owner of the wheat land do all the fencing? In deference to one of the most fundamental of all American principles, should not the cattle and sheep owner be limited at his expense, whether by fencing or herding, to the use of those grounds only on which, as his property, he has the right to pasture them?

It may be said that the circumstances of the soil, climate and face of the country differ greatly in California from those of the older States. This we will grant freely, but with the reservation that the differences stipulated for in such an exception are exactly the opposite to what the circumstances call for. We quote in this connection the provisions of the Fence Laws of several of the older States, as ascertained by researches into their statutes, at the State Library, in Sacramento.

Vermont (Revised Statutes) requires that all division fences shall be paid for and maintained equally by both parties owning adjoining lands, and that "whenever lands of two or more persons shall be so situated that either party may not be compelled to build and keep in repair a fence on the dividing line between their lands respectively, by reason of open or unoccupied lands or highways lying between, each owner or keeper shall be liable for damages done on the unoccupied lands of the others, by reason of any animal estraying from his lands and being taken on the lands of others."

Kansas, Ohio, Massachusetts, Illinois, New York and Pennsylvania all compel the owners of adjoining lands, however occupied, to divide the expense of building and maintaining division fences. They all provide for the settlement of disputes about fences and trespasses to "Fence Viewers," who are either town or county officers, or by neighborhood arbitration, and they punish the owner of trespassing cattle when breaking through a lawful fence.

Pennsylvania, by several statutes passed from eighteen hundred and sixty-four to eighteen hundred and sixty-seven, prevents the running at large of cattle, sheep, hogs, goats or other domestic animals, all of which, unless accidentally escaped, found upon inclosed or uninclosed lands, or in the highways or commons, may be impounded and sold for damages unpaid.

New Jersey compels the owner of horses, cattle, sheep and other animals to keep them on his own premises, and when straying on the land of another, such owner or possessor is liable for any damage they may do. (Nixon's Digest, page 23, note.)

It is to Texas only that we must look to find a precedent for the unjust laws which disgrace our statute book. In that sparsely settled community, where culture is scarce and the cattle interest predominant,

we find that farmers are compelled to do all the fencing, failing wherein they are punishable for killing and wounding cattle trespassing on their premises, while no liability is imposed on cattle owners for any damage their stock may do, unless the farmer's fence be a lawful one.

Oregon has no laws upon this subject. We have been informed that within the last two years several of the older States have repealed their Fence Laws, but we have not had time to examine their latest statutes on the subject. But so far as our examination has extended we have found no laws in existence in any State, except Texas, obliging cultivators to build all fences, and releasing the stock owner from all obligation to pay for any portion of the fence rendered necessary solely as a protection for other parties against the stock owned by him.

The consequence of this peculiarity of our laws is that ninety-seven one hundredths of the State is by law declared to be a common, wherein wild cattle are at liberty to range where they will, regardless of proprietary lines. The evils thus imposed on the farmer may be briefly enumerated as follows:

First—If land costs one dollar per acre, fencing, which in many parts of the State must always be made of lumber imported by sea, costs from five dollars to eight dollars per acre; thus calling for five to eight times as much capital in beginning a farming enterprise as would be required merely for the purchase of land. This is the cost where lumber is accessible.

Second—The lands of the interior valleys are often so distant from lumber that the expense of hauling it makes fencing impracticable. Hence millions of acres lie in a perpetual fallow, that would otherwise teem with a productive population.

Third—Timber fences are peculiarly liable in California to destruction from fires and floods, as well as from decay and the breaches of cattle. Hence the repairs are an annual item of expense, adding materially to the cost of grain growing and other culture.

Fourth—Live fences cannot be cultivated without the protection of timber, stone or some other kind of fence; and when raised they are very subject to injury by gophers. So that to attempt their use is to double or treble the cost of protecting the crops.

Fifth—It is impossible to attempt the planting of the locust, oak, maple, or other forest trees for timber, though such investments would be immensely profitable, and are absolutely necessary, considering the rapid extermination of the native oak now in progress, and the lack in California of all hard woods suitable for ship timber and other mechanical uses. If we abolish the necessity of fencing on the part of planters, or otherwise compel the cattle owners to let their neighbors' crops alone, thousands of acres would soon be planted in this manner, to the far greater advantage even of the present generation than the perpetuation of the present system.

Sixth—The forced separation of meat-raising and cultivation deprives the farmer of that means of renovating the soil by manure, without which the experience of the world proves that the best lands will rapidly deteriorate. The scientific agriculturist already looks with dismay upon the inevitable result of our system of tillage, which cannot fail in time to substitute for the rich soils of to-day the worn out deserts so frequent in Virginia, North and South Carolina, once as fertile as ours. This consideration is of the gravest importance to our continued success in agricultural pursuits. The law of nature is universal that a soil con-

tinually exhausted by successive harvests, especially of the same crop, without manuring from time to time, will gradually but surely lose its productive powers. But how is the California farmer to renovate his land? The grain-raiser cannot afford to keep cattle merely for the sake of making manure. They must also pay him with their meat. But the meat raised by the small farmer, though superior in quality, costs more to produce it than that of the ranchero, who has cattle on a thousand hills, roaming over everybody's land, without fencing, feeding or care. Hence the poor beef raised by the ranchero bears the market to so low a point as to ruin the small farmer in his attempts to raise the better article. The result is the complete separation of the two interests, with all the damage to the permanent growth of agriculture consequent thereon.

It may be replied to this statement that it is contrary to present facts, and that a large portion of the cattle in the State are now of better breeds than formerly, and are kept by grain farmers in inclosed grounds. That some progress has been made in this direction during a few years past is true; but that progress never could have been inaugurated, so far as raising beef is concerned, had it not been for the extraordinary drought of eighteen hundred and sixty and eighteen hundred and sixty-one, followed by the great flood of eighteen hundred and sixty-two, causing such wholesale destruction of the wild cattle, especially in the southern counties, as to remove for a while their pressure on the farming interests. But that pressure is now being annually renewed with a grip tighter and tighter, as the wild cattle again increase and multiply. It is for this reason that we urge immediate action in the matter. If we wait even two years more, till the next session of the Legislature, an interest now of trifling comparative importance will have gained so materially on the struggling agriculture of the State that a much more powerful influence will be brought to bear against the liberation of the farmers from the oppression they complain of.

And in this connection we proceed to ascertain the present comparative magnitude of the two interests contending over the fence question, and to examine whether the American principle of the greatest good to the greatest number does not require the repeal or modification of these laws.

Our State contains one hundred and sixty thousand square miles, equal to one hundred and two million four hundred thousand acres.

Of these, about sixty thousand square miles, or thirty-eight million four hundred thousand acres, may be tillable, but only one million seven hundred and seventy-four thousand three hundred and twenty-seven acres were cultivated, although four million two hundred and seven thousand one hundred and thirty-one acres were inclosed in eighteen hundred and sixty-six. It is well known that not more than one tenth of the surface of the State is really fit for cultivation, on account of mountains, alkali deposits, want of moisture and swamps, although the estimate of thirty-eight million four hundred thousand acres is probably near the mark, in view of the time when a dense population and cheap labor shall make available, by artificial means, many districts that cannot now be used to advantage. It is also well known that a very large proportion of the mountains and tules, unfitted for the plough, is as well suited for the pasture of cattle and sheep as the richer valleys. From a condensation of the report of the Surveyor-General for eighteen hundred and sixty-six and part of eighteen hundred and sixty-seven, published in the Bulletin of December sixth, eighteen hundred and sixty-seven,

we find the product of the tillage of these one million seven hundred and seventy-four thousand three hundred and twenty-seven acres, in eighteen hundred and sixty-six, stated as follows:

Product.	Value.
14,080,752 bushels wheat, worth $1	$14,080,752
11,605,922 bushels barley, worth 45c	4,722,615
1,864,279 bushels oats, worth 50c	932,189
358,584 tons hay, worth $8	2,868,672
1,791,633 gallons wine, worth 40c	716,653
1,983,068 bushels potatoes, worth 60c	1,195,841
181,850 bushels peanuts, worth $3	545,550
242,212 bushels beans, worth $1 56	363,319
Total value	$25,425,591

These values are placed by the Surveyor-General at nearly a million and a half above the gold product of that year, which was twenty-four million dollars.

The same authority gives the number of neat cattle in the State at four hundred and thirty-six thousand three hundred and sixty-three, which, at an average value of twenty dollars per head, would exhibit a capital of eight million seven hundred and twenty-seven thousand two hundred and sixty:

Increase and Product.	Value.
Estimating the annual increase of this stock at 20 per cent. we have a product therefrom of	$1,745,452
Add 4,449,835 pounds of butter at 30c	1,334,950
And 2,110,058 pounds of cheese at 15c	316,508
Total product from neat cattle	3,396,910
The same authority states the number of sheep in the State at 1,346,749, which, at an average value of $3 per head, represent a capital of $4,040,247. Allowing 40 per cent. for the average annual increase of sheep, and we have a revenue of	1,616,099
Add 5,229,826 pounds of wool at 16c	836,772
Total product from cattle and sheep	$5,849,781

As the one hundred and nine thousand nine hundred and seven horses and the twenty-one thousand three hundred and ten mules in the State are believed to be nearly all kept within inclosures or in use for labor, and hogs are already prohibited from running at large, we leave them out of the calculation. So that it appears from these figures that the

amount of capital invested in cattle and sheep is only about half the annual product of the farming interest, while the revenue derived from the stock is only one quarter of that realized from the farms, and this, too, after allowing the butter and cheese as a credit to the wild cattle owners, who, in fact, produce nothing of the kind, though they are the only stock owners who object to the repeal of the Fence Laws.

These figures, then, show conclusively that our Fence Laws transfer from a minority of one fourth the agricultural interest upon a majority of three fourths all the expense necessary to protect the majority from the encroachments of the minority! If this be analogous to any other American legislation, except that which taxes the honest majority with the expense of jails for the thieving few, we confess we are unable to see it!

But let us see how great is the tax imposed by this most peculiar and unjust legislation upon the farmer, and what proportion that tax alone, and the interest and expenses attendant upon it, bear to the value of the stock and the increase thereof. Four millions two hundred and seven thousand one hundred and thirty-one acres of land were under fence at the close of eighteen hundred and sixty-six. Supposing the fences divide the land into three hundred and sixty acre lots (which is twice the usual size of grain farms) we have, at one and one half miles to each farm, no less than seventeen thousand five hundred and twenty-nine miles of fencing, and this at five hundred dollars per mile (a moderate average estimate) amounts to eight millions seven hundred and sixty-two thousand five hundred dollars as the capital invested in fencing.

The interest on this sum at one and one half per cent. per month (a low rate for farmers' money) is per annum.....	$1,577 610
Add depreciation and repairs, at fifteen per cent. per annum..	1,314 675
Annual expense for keeping up fences.....	$2,892 285

We have now the following data for comparison:

Fences cost.....	$8,764 500
Cost per annum.....	2,892 285
Value of stock.....	12,767 447
Annual product.....	5,849 781

So that the cost of fences to the farmers is fully two thirds the value of all the cattle and sheep in the State, while more than half the product of the live stock to their owners is assessed in an annual tax on the farmers as a license for carrying on the business of tilling the soil.

We acknowledge ourselves unable to see wherein the wild cattle owners would be seriously damaged by being compelled to retire into the mountains or pastures distant from cultivation. Cattle transport themselves. The wages of vaqueros are no greater while driving stock than while herding them. After the ten millions of acres of good land near market are taken up for the plough, there will remain not less than

ninety-two millions and four hundred thousand of other acres, of which the larger part is just as suitable for grazing as the present pastures. If cattle cannot be driven through a cultivated country to market unless the highways be fenced, why not leave it to the Supervisors of each county to declare what roads shall be used for that purpose, and to provide for such fences only at the expense of the county? The wild cattle interest is one which conflicts with the progress of civilized society, and should be driven to a distance or otherwise discouraged until it becomes extinct. The farming interest, on the contrary, must increase, if the history of the Western States is to be the precedent for our growth, and its future looms up before us in gigantic proportions. Can this be doubted? Look once more at the figures. In eighteen hundred and sixty-six, only one million seven hundred and forty-four thousand three hundred and twenty-seven acres, under the plough, produced twenty-five millions four hundred and twenty-five thousand five hundred and ninety-one dollars of farming produce. This is fourteen dollars per acre, and clearly a low estimate. But apply it to six millions of acres and the product reaches eighty-four millions of dollars. If ten millions of acres be farmed it reaches one hundred and forty millions of dollars. And what are ten millions of acres out of one hundred and two millions and four hundred thousand acres, and what signify our wild cattle interest, or even our mines of precious metals, when compared with the enormous stimulous to commerce and manufactures which would result from the cultivation of only ten per cent. of the surface of the State?

In conclusion, we respectfully represent, that if the Legislature would repeal all the fence laws on our statute book, with the exception of that passed in eighteen hundred and sixty-four, for the benefit of Sacramento, Solano, Butte and Yolo Counties, and extend that statute to every county in the State; or if they would substitute for all our statutes that New Jersey law which compels owners of all live stock to keep them on their own premises, at their own risk and expense, they would confer on the most important interest of our State a boon of more value than any other in the gift of the State Government.

All of which is respectfully submitted.

C. T. HOPKINS (Chairman),
ALBERT DIBBLEE.

Mr. Lewis moved the communication and report be laid on the table.

Hon. Mr. Biggs of Sacramento moved to amend by laying on the table indefinitely, and stated as a reason for such motion that the subject of Fence Laws was one about which there were various opinions; that in his opinion the time had not come in California when a uniform law of no fences should be adopted by the Legislature; that the introduction of the question before the State Agricultural Society would tend to create discord and would work an injury to the society.

There seemed to be no disposition to enter into a discussion of the subject, though there was evidently a wide difference of opinion as to the merits of the question itself, as also upon this summary manner of disposing of the communication and report, so the whole subject was laid on the table without debate.

FINANCE.

The Committee on Finance, through their Chairman, E. I. Robinson, came in and stated that they had not had time to make the necessary examination of the report referred to them and asked further time, which was granted.

The meeting then adjourned until the thirty-first instant, at two o'clock P. M.

SECOND DAY.

FRIDAY, January 31st, 1868.

The time to which the meeting was adjourned having arrived, President Reed called the meeting to order and called for the report of the Finance Committee.

REPORT OF FINANCE COMMITTEE.

The Chairman of the Committee handed in the following report, which was read by the Secretary:

SACRAMENTO, January 30th, 1868.

To C. F. REED,
President State Agricultural Society:

The Committee to whom was referred the accounts of the Secretary and Treasurer of the State Agricultural Society, beg leave to report that they have carefully examined the same and find them correct in every particular.

E. I. ROBINSON,
C. H. SWIFT,
M. D. BORUCK.

On motion, the report was received and adopted, and ordered on file.

There being no further business, the meeting adjourned *sine die*.

FIRST MEETING OF THE NEW BOARD OF DIRECTORS.

SACRAMENTO, January 30th, 1868.

Immediately after the adjournment of the Society on this day, the President called a meeting of the Board of Directors in the Secretary's office.

Present—Charles F. Reed, President, and the following Directors: T. L. Chamberlain, of Placer County; B. R. Crocker, J. H. Carroll, William P. Coleman, C. T. Wheeler and H. M. Larue, of Sacramento; R. S. Carey, of Yolo, and H. R. Covey, of San Francisco.

ANNUAL FAIR.

Mr. Carroll moved that the time for holding the annual Fair of the State Agricultural Society for eighteen hundred and sixty-eight be fixed to commence on the fifteenth of September, and to close on the twenty-fifth of the same month.

After a general discussion of the subject, the motion was carried unanimously.

ELECTION OF SECRETARY AND TREASURER.

Mr. Coleman moved that the Board go into an election for Secretary and Treasurer.

The motion was seconded by Mr. Chamberlain.

Mr. Larue moved to adjourn until seven o'clock in the evening.

It was suggested that as the object of the motion to adjourn was to obtain a full Board, a recess for half an hour would do as well. So the Board took a recess.

Upon reassembling in half an hour all the members above named were present, and also R. S. Carey of Yolo, and Edgar Mills, of Sacramento.

Mr. Coleman's motion was again called up, and it was agreed to vote by ballot.

Messrs. Larue and Carroll were appointed tellers.

The result of the first ballot for Secretary was as follows: I. N. Hoag received six ballots, and E. B. Ryan three.

On motion of Larue, the election of I. N. Hoag was made unanimous.

R. T. Brown was then re-elected Treasurer by a unanimous vote.

After transacting some other business, the Board adjourned to meet at the call of the President.

FINANCE REPORTS.

REPORT OF THE TREASURER.

STATE AGRICULTURAL SOCIETY,

In account with R. T. BROWN, Treasurer.

CR.	
By amount of cash received at various times from the Secretary, to date	$24,470 99
DR.	
To amount disbursed at various times upon orders of the President and Secretary	$24,479 23
Disbursements over receipts	$8 24

R. T. BROWN,
Treasurer.

SACRAMENTO, January 1, 1868.

REPORT OF THE SECRETARY.

I. N. Hoag, Secretary,

In account with State Agricultural Society.

Date.	On what account.	Amount.
1867.	RECEIPTS.	
January 1..	Cash on hand	$246 89
Jan. 30.....	Rent of Park	475 00
"	For memberships at annual meeting	85 00
May 18.....	Rent of Park for April, May and June	375 00
July 17.....	State appropriation, in part	1,500 00
July 19.....	Rent of Park for July, August and September, in part	200 00
August 26..	Balance of State appropriation	2,500 00
Sept. 7.....	Memberships and tickets	465 00
Sept. 9.....	Entries for races	785 00
"	Memberships and tickets at Hall	2,368 00
"	Memberships and tickets at Park	1,335 50
Sept. 10....	Entries for races	180 00
"	Tickets and memberships at Hall	1,438 00
"	Tickets and memberships at Park	1,223 00
Sept. 11....	Entries for races	275 00
"	Tickets and memberships at Hall	1,271 00
"	Tickets and memberships at Park	1,347 50
Sept. 12....	Entries to races	165 00
"	Tickets and memberships at Hall	1,020 00
"	Tickets and memberships at Park	1,985 00
Sept. 13....	Entries for races	490 00
"	Tickets and memberships at Hall	826 00
"	Tickets and memberships at Park	1,107 50
Sept. 14....	For entries	41 25
"	Tickets and memberships at Hall	508 50
"	Tickets and memberships at Park	868 00
Sept. 16....	At Hall	200 00
"	At Park	81 50
Sept. 17....	At Hall	150 00
"	At Park	48 50
"	For entries and sweepstakes on the 16th	115 00
Sept. 19....	At Hall	104 00
"	For rent of bar at Hall	132 00
Sept. 20....	Balance for rent of Park, July, August and September	175 00
"	Rent of soda fountain at Hall	30 00
"	Sale of straw left	31 85
Nov. 14.....	Rent of Park to January	375 00
Dec. 28.....	Life membership of Sweetland	40 00
"	Cash drawn for Times and returned, having been paid	7 00
	Total receipts	$24,470 99

Date.	On what account.	Amount.
1867.	EXPENDITURES.	
February 2	Paid G. W. Fern, premium on best five acres Chile clover, awarded at annual meeting	$15 00
February 5	I. N. Hoag, salary for January	150 00
Feb. 14	I. N. Hoag, salary and disbursements for February	157 25
March 2	H. S. Crocker & Co., for printing	17 00
"	I. N. Hoag, salary for March	150 00
May 8	I. N. Hoag, salary for April	150 00
May 18	George Rowland, Post Office box rent and stamps	15 00
"	J. H. Coffee, carpenter work on main stand and Park	200 00
May 21	N. D. Goodell, for boxing trees at Park	70 00
"	W. P. Coleman, for legal tenders and Post Office stamps	15 00
"	I. N. Hoag, salary for May	150 00
July 18	N. L. Drew & Co., for lumber for main stand	256 66
"	H. S. Crocker & Co., for printing premium list	103 00
July 20	John Caraghan, nails for main stand	29 87
"	Edwards & Co., for stationery	18 50
July 20	Powell Lawson, for tin roof for main stand	153 60
"	J. H. Coffee, carpenter work on main stand	350 00
July 26	J. McGuire, iron work on main stand	24 75
Aug. 2	Sacramento Gas Company for gas and setting metre	2 90
Aug. 3	Mart Taylor for filling diplomas	1 95
"	H. Rosecrans, San Francisco, for expenses in assisting to get up Fair	400 00
Aug. 10	Fitzsimmons & Gleason, for zincing tank at Park	99 00
"	E. M. Smith, premium on vineyard	20 00
	Paid the following persons for work on machine building:	
"	J. L. Briggs, five days	20 00
"	C. L. Knowles, five days	20 00
"	William Skillan, three days	12 00
"	S. W. Harrington, four and one half days	17 50
"	S. H. Wilburn, two days	6 00
"	John Malone, two days	6 00
"	J. White, four days	16 00
"	D. Woods, four days	16 00
"	C. P. Gifford, five days	20 00
Aug. 17	S. H. Wilburn, three days	9 00
"	J. White, six days	24 00
"	J. Malone, three days	9 00
"	S. W. Harrington, five and one half days	22 00
"	William Skillan, six days	24 00
"	D. Woods, six days	24 00
"	C. L. Knowles, six days	24 00
"	William G. Persing, two and one half days	10 00
"	C. Gifford, three days	12 00

Date.	On what account.	Amount.
Aug. 17....	A. A. Flint, paid for twelve show-cases and picture frames	$257 00
"	Joel Johnson, moving steam boilers	85 00
"	J. Q. A. Warren, for collections at Sandwich Islands, in full	50 00
	Paid the following persons for work on machinery and machine building:	
Aug. 24....	S. W. Harrington, five and one half days	22 00
"	C. L. Knowles, six days	24 00
"	J. White, six days	24 00
"	D. Woods, five and one half days	22 00
"	William G. Persing, four days	16 00
"	William Skillan, three days	12 00
"	S. H. Wilburn, three and one half days	10 50
"	B. Cavanaugh, one day	4 00
"	G W. Badger, repairing flag	5 00
"	W. P. Coleman, for legal tenders for Post Office stamps	14 60
Aug. 31.....	C. L. Knowles, six days	24 00
"	Hogshead and drayage	2 00
"	P. Kelly, one half day	1 25
"	John Williams, one and one half days	4 50
"	S. W. Harrington, six days	24 00
"	John White, one half day	2 00
"	S. H. Wilburn, six days	18 00
"	W. G. Persing, three and three fourths days	15 00
"	T. J. McKim, to date	152 75
"	A. A. Flint, for two ladders	12 00
"	I. N. Hoag, salary for June	150 00
Sept. 7.....	B. R. Gray & Co., for seven gold medals	276 50
Sept. 13.....	Chase & Boruck, for advertising Fair	50 00
"	Warren & Co., for advertising Fair	50 00
Sept. 17.....	Joseph Neumann, for expenses to Fair, as per agreement	150 00
"	S. Daniels, for premiums on stock	340 00
Sept. 20.....	Silas Nelson, for whitewashing fence and stalls at stock ground	60 00
Sept. 9.....	Paid for purses	250 00
"	Paid for purses	400 00
"	Paid for purses	250 00
Sept. 10.....	Paid for purses	350 00
"	Paid for purses	400 00
Sept. 11.....	Paid for purses	150 00
"	Paid for purses	400 00
Sept. 12.....	Paid for purses	250 00
"	Paid for purses	400 00
"	Paid for purses	100 00
Sept. 13.....	Paid for purses	400 00
"	Paid for purses	150 00
Sept. 14.....	Paid for purses	500 00
"	Paid for purses	400 00

Date.	On what account.	Amount.
Sept. 14 ...	Paid for purses	$200 00
	Paid the following premiums at Stock Grounds:	
Sept. 16.....	Theodore Winters	60 00
"	J. A. Wheeler	75 00
"	D. H. Lowrey	40 00
"	P. Borger	40 00
"	J. Dinwiddie	30 00
"	Ed. Roberts	20 00
"	J C. Davis	15 00
"	C. P. Marsh	40 00
"	Ed. Roberts	30 00
"	J. C. Davis	20 00
"	J. C. Davis	15 00
"	J. C. Davis	10 00
"	A. T. Leachman	40 00
"	D. France	20 00
"	William H. Frye	15 00
"	J. A. Wheeler	40 00
"	James S. Barnes	20 00
"	A. Parker	15 00
"	C. P. Marsh	15 00
"	Thomas Morgan	30 00
"	D. H. Lowery	25 00
"	D. H. Lowery	15 00
"	D. H. Lowery	10 00
"	S. B. Whipple	40 00
"	Thomas Fitzgerald	30 00
"	E. M. Skaggs	30 00
"	S. B. Whipple	20 00
"	T. Fitzgerald	15 00
"	H. W. Seale	40 00
"	E. M. Skaggs	40 00
"	Leroy Whitmore	15 00
"	C. H. Shear	30 00
"	W. F. Swimley	20 00
"	W. B. Gibson	15 00
"	S. B. Whipple	100 00
"	J. M. Laughlin	50 00
"	Thomas Edwards	40 00
"	Robert Branton	10 00
"	Robert Branton	30 00
"	Robert Branton	15 00
"	M. H. Meagher	15 00
"	J. J. Cook	30 00
"	Robert Branton	25 00
"	Robert Branton	30 00
"	Robert Branton	10 00
"	J. D. Patterson	20 00
"	J. D. Patterson	20 00
"	J. D. Patterson	15 00

Date.	On what account.	Amount.
Sept. 16....	J. D. Patterson	$15 00
"	J. D. Patterson	15 00
"	J. D. Patterson	15 00
"	J. D. Patterson	25 00
"	N. Woodbeck	15 00
"	N. Woodbeck	10 00
"	N. Woodbeck	10 00
"	C. S. Lowell	5 00
"	P. Burns	5 00
"	Paid for purses	100 00
Sept. 17....	Paid for purses	250 00
"	L. Prevost, on premium	40 00
	Paid the following premiums:	
Sept. 20.....	Baker & Hamilton	166 00
"	O. H. Jackson	10 00
"	P. H. Murphy	10 00
"	E. T. Mears	10 00
"	Miss Allmond	2 00
"	Mrs. J. P. Odbert	2 00
"	Mrs. William Brooks	3 00
"	L. K. Hammer	95 00
"	P. J. Devine	25 00
"	L. L. Graham	4 00
"	A. Runyon	37 00
"	Mrs. Crissman	3 00
"	Mrs. Cronkite	6 00
"	M. S. King	10 00
"	A. Wheelan	5 00
"	E. Pierce	10 00
"	J. P. Odbert	14 00
"	Norton Bush	30 00
"	Mrs. Flanders	3 00
"	Norton Bush	20 00
"	D. L. Perkins	30 00
"	J. L. Derby	3 00
"	H. Fletcher	10 00
"	A. H. Cheney	5 00
"	J. P. Odbert	5 00
"	T. B. Lamb	2 00
"	Goodwin & Co	38 00
"	Mission Woollen Mills	70 00
"	J. A. Todd	15 00
"	J. G. Allmond	22 00
"	Colonel Warren (bill)	10 00
"	Thomas Milgate	3 00
"	Thomas Hansbrow	38 00
"	Oakland Cotton Mills	50 00
"	R. C. Merkley	20 00
"	W. W. Marvin	28 00
"	H. R. Covey	30 00
"	Wilcox	10 00

Date.	On what account.	Amount.
Sept. 20....	Gillis	$10 00
"	J. B. Hoit	35 00
"	Roberts & Rawson	55 00
"	Penn	6 00
"	Treadwell & Co	27 00
"	A. Whelan	2 00
Sept. 21....	Joseph Leeman, assistant engineer	42 00
"	Gas Company, for gas	340 00
"	Thomas Hansbrow, for merchandise	40 62
"	T. J. McKim, engineer	83 00
"	S. W. Harrington, engineer	64 00
"	B. Bullard, assistant entry clerk	40 00
"	D. Woods, carpenter	84 50
"	B. B. Baldwin, assistant entry clerk	36 00
"	J. S. Barnes, gatekeeper	74 00
"	George W. Whitlock, superintendent	82 00
"	Isaac Galloway, rope tender	15 00
"	Fred. Patton	24 00
"	W. T. Crowell, Assistant Secretary	83 00
"	M. Sanborn, carpenter	24 00
"	A. S. Taylor, collector on stairs	24 00
"	C. A. Stevens, entry clerk	72 50
"	William Fail, laborer	48 00
"	J. L. Lee, laborer	39 00
"	W. T. Smith, laborer	15 00
"	G. T. Glover, ticket clerk	24 00
"	William M. Millard, collector	24 00
"	H. B. Warner, ticket clerk	24 00
"	C. G. Jackson, entry clerk	60 00
"	G. P. Warner, ticket clerk	35 00
"	A. Keithley, night watch	52 00
"	C. E. Crocker, collector	24 00
"	H. S. Crocker & Co., printing	210 74
"	James Anthony & Co., advertising	163 00
"	George N. Daggett, night watch	48 00
"	E. B. Ryan, entry clerk	45 00
"	Beardslie & Hooker, hay	136 24
"	Edwards & Co., stationery	29 00
"	Grimes & Crowell, merchandise	15 00
"	B. T. Bibbins, bill poster	22 50
"	G. T. Witham, doorkeeper	8 00
"	J. Hood, washing and cleaning hose	5 00
"	T. C. May, drayage	37 75
"	Samuel Jelly, cup for premium	12 50
"	M. T. Crowell, bar	30 00
"	Israel Luce, expenses	10 00
"	John Nickerson, police	24 00
"	B. Cavanaugh, police	24 00
"	Charles Brady, police	24 00
"	R. L. Bampton, collector	24 00
"	T. H. Higginson, doorkeeper	30 00

Date.	On what account.	Amount.
Sept. 21....	W. S. Coombs, carpenter	$4 00
"	Hotchkiss & Co., sawdust	8 00
"	J. Duffy, drayage	15 50
"	A. C. Bidwell, wood	127 50
"	Thomas Byrnes, labor	72 00
"	B. R. Crocker, sundries	584 75
"	Mrs. P. Burns, premiums	15 00
"	C. D. Semple, advertising	20 00
"	Baker & Hamilton, merchandise	6 00
"	S. H. Wilburn, labor	57 00
"	E. F. Aitken, premiums	24 00
"	C. W. Reed, premiums	30 00
"	Jesse Slaughter, whitewashing, etc	100 50
"	Slaughter and Gale, labor, etc	75 00
"	H. T. Root, expenses	13 00
"	J. M. Boardman, painting	9 00
"	E. T. Boyle, police	24 00
"	C. F. Reed, expenses	300 00
"	J. C. Devine & Brother, premium	10 00
"	H. T. Holmes & Co., lime	12 40
"	W. W. Marvin, collector	24 00
"	F. S. Malone, horse and buggy for Reed	42 00
"	Gates & Brother, merchandise	21 07
"	Huntington & Hopkins, merchandise	204 34
"	George Schmeiser, engineer work	147 07
"	Daily Bee, advertising	51 00
"	L. E. Crane, Marshal	192 00
"	Goss & Lambard, merchandise	1,269 37
Sept. 21....	E. H. Astbury, lighting gas	45 00
"	A. A. Flint, balance on show-cases	12 00
"	L. P. Marshall, premiums	20 00
"	J. E. Smith, ticket clerk	47 50
"	John Talbot, ticket clerk	24 00
"	M. S. King, premium	10 00
"	D. W. Clark	343 88
"	Mrs. C. Johnson, waiter	27 00
"	Wm. Melvin, hooks	8 75
"	C. P. O'Neil, police	24 00
"	I. N. Hoag, salary	450 00
Sept. 28....	J. Coffee, balance work on main stand	84 00
"	N. L. Drew, use lumber	266 09
"	John Rider, premiums	7 00
"	C. A. Stevens, clerk	28 00
"	N. H. Dodson, doorkeeper	24 00
"	Wm. G. Young, premium	5 00
"	Cornet Band	464 00
"	John Hood, watchman	4 00
"	L. Powers, merchandise	21 00
"	T. Byrne, labor	13 50
"	S. W. Butler, drayage	10 00
"	Allmond, premium	1 00

Date.	On what account.	Amount.
Sept. 28....	Gilpatrick, labor	$34 50
"	Hill & Knaught, premium	10 00
"	C. L. Knowles, carpenter	91 00
"	M. Sprague, services, etc	66 27
"	W. C. Hopping, hay	152 20
"	Jersey, bill poster	3 00
"	Daniel Flint, premium	18 00
"	James Duffy, drayage	3 00
"	D. W. Madden, merchandise	24 00
"	Marysville Appeal, advertising	20 00
"	Times Publishing Company	7 00
"	Samuel Garber, posting bills	3 00
"	Michael Dunn, drayage	1 50
"	Redstone Bros., premiums	30 00
"	W. H. Sinclair, labor	12 50
"	Hamburger & Co	25 35
"	Aitkin & Co., premium	5 00
"	Pacific Insurance, damage	7 50
"	L. Allen, straw	91 50
"	A. Adams, premium	20 00
Oct. 5th ...	B. Dennery, use of crockery	37 00
"	Stockton Independent	38 00
"	O'Connell, Ryan & Co., merchandise	2 25
"	Mrs. Blackleach, merchandise	20 60
"	—— Coleman	4 00
"	John Hall, premiums	170 00
"	B. N. Bugbey, premiums	48 00
"	H. Wachhorst, merchandise	81 00
"	J. Lohman, premiums	5 00
"	Wm Mace, premiums	10 00
"	W. P. Coleman, legal tenders	7 20
"	G. K. Van Heusen, use merchandise	7 00
"	Gas Company, gas	90
"	S. H. Wilburn, labor	18 00
"	Robert Anderson, labor	50 00
"	Mrs. J. Bayer, premiums	8 00
"	—— Frazer, drayage	50
"	Neil & Clark, premium	5 00
"	T. Hansbrow, superintendent	100 00
"	L. Provost, balance premiums	10 00
"	Joseph Neumann, premium	40 00
"	C. H. Krebs, merchandise	4 90
"	Edwards, premium	5 00
Oct. 12th...	C. F. Reed, expenses	200 00
"	P. Caduc, ice	29 50
"	M. Rose, repairing wells	14 00
"	C. T. Scholl, premium	10 00
"	J. A. Mason, premium	25 00
"	D. Woods, labor	4 00
"	Bergman, premiums	21 00
"	Gates & Bro., merchandise	75

Date.	On what account.	Amount.
Oct. 12th...	John Isaacs, police	$28 00
"	W. S. Harrington, engineer	6 00
"	J. H. Sanderson, premiums	35 00
"	Wm. Schacht, watering streets	15 00
Oct. 31st...	Thomas Cotter, premiums	35 00
"	David Strickland, engineer	40 00
"	G. H. Baker, diplomas	187 50
"	San Francisco Bulletin, advertisement	9 50
"	D. Stoddard, injector	185 00
"	T. McConnell, premiums	15 00
"	Fuller & Heather, merchandise	498 75
"	Gillig, Mott & Co., merchandise	14 90
"	H. Wachhorst, merchandise	2 00
"	Wm. M. Haynie, premiums	100 00
"	J. H. Pierce, filling diplomas	20 00
"	I. N. Hoag, salary	150 00
"	E. McConnell, premium	15 00
Nov. 14th..	Golden Eagle Hotel, hack hire	25 00
Nov. 16th..	Francis Graham, premiums	35 00
"	J. H. Pierce, filling diplomas	40 00
Nov. 22d...	J. H. Pierce, filling diplomas	20 00
Nov. 30th..	J. H. Pierce, filling diplomas	20 00
Dec. 2d.....	Sacramento Union, advertisement	12 50
Dec. 3d.....	L. J. Burrell, premium	10 00
Dec. 12th...	Locke & Lavenson, merchandise, etc	231 81
"	J. H. Pierce, filling diplomas	20 00
Dec. 13th...	I. N. Hoag, salary, November	150 00
Dec. 27th...	I. N. Hoag, salary, December	150 00
"	N. G. Curtis, old debts	621 00
"	J. H. Pierce, filling diplomas	17 25
"	I. N. Hoag to pay the following:	
"	Henry A. Gaston	3 00
"	J. S. Harbison	8 00
"	Mrs. I. N. Hoag	8 00
"	D. Clanman	3 00
"	C. Detten	20 00
"	Thomas Pettinger	10 00
"	Isader Landsberger	20 00
"	E. M. Smith	20 00
"	L. S. Graham	3 00
"	E. Ketchum	3 00
"	A. Gaffanesch	3 00
"	Silas Selleck	10 00
"	William Shew	50 00
Dec. 27th...	T. A. Talbert, old warrant	20 00
	Total expenditures	$ 24,479 23
	Total receipts brought forward	24,470 99
	Expenditures over receipts	$ 8 24

TRIALS OF SPEED IN 1867.

MONDAY, SEPTEMBER 9TH.

FIRST TRIAL.—*Trotting race*—Mile heats; three in five; free for all second class stallions; purse—two hundred and fifty dollars.

Judges: Morris J. Dooley, George Treat and J. M. Duncan.

Entries—J. L. Eoff entered Kentucky Hunter.
Israel Larock entered Ben. Franklin.
W. W. Burdett entered Fly-by-Night.

Result—Ben Franklin	3	3	3	1	1	1
Kentucky Hunter	2	1	2	2	2	2
Fly-by-Night	1	2	1	3	3	3

Time—First heat—2:41½; second heat—2:37¼; third heat—2:38¾; fourth heat—2:44½; fifth heat—2:53½.

SAME DAY.

SECOND TRIAL.—*Pacing race*—Mile heats; three in five; purse—two hundred and fifty dollars.

Entries—C. H. Shear entered Empress.
Robert Mellen entered Mike O'Brien.
S. C. Bowley entered Henry Longfellow.
Barney Rice entered Dick Gough.

Result—Empress	3	1	1	2	1
Mike O'Brien	2	2	2	1	2
Henry Longfellow	1	3	3	3	3
Dick Gough	4	4	4	4	4

Time—First heat—2:29; second heat—2:33¼; third heat—2:38¼; fourth heat—2:40¾; fifth heat—3:07½.

TUESDAY, SEPTEMBER 10TH.

FIRST TRIAL.—*Trotting race*—Two-mile heats; free for all trotters; purse—four hundred dollars.

Judges: M. J. Dooley, J. M. Duncan and E. J. Weeks.

Entries—J. L. Eoff entered Lowry Matthews.
Barney Rice entered Genoa Maid.
G. B. Coombs entered Lady Fine.
C. H. Shear entered Paddy Magee.
John M. Daniels entered Fillmore.

Result—Lowry Matthews	1	1
Lady Fine	4	2
Paddy Magee	2	3
Genoa Maid	3	4
Fillmore	5	5

	First heat.	Second heat.
Time—First mile	2:43 4-5	2:42
Second mile	2.44 2-5	2:45 1-5
Total	5:28 1-5	5:27 1-5

SAME DAY.

SECOND TRIAL.—*Running race*—Mile and repeat; free for all three year old colts; purse—three hundred and fifty dollars.

Entries—R. T. O'Hanlon entered Wilbur.
C. S. Williams entered Compromise.
R. T. Leet entered Lancaster.
Thomas White entered Bloomsbury.
John Hall entered May.
A. Musick entered Ellen Moore.

Result—Compromise	1	1
Wilbur	2	3
Bloomsbury	3	2
Lancaster	4	4
Ellen Moore	dis.	
May	dis.	

Time—First heat—1:47 4-5; second heat—1:47 2-5.

SAME DAY.

THIRD TRIAL.—*Running race*—Two-mile heats; free for all; purse—four hundred dollars.

Entries—Theodore Winters entered Alex. Barnes.
John M. Hall entered Isola.
R. T. Leet entered Flora.
R. T. O'Hanlon entered Transita.
C. S. Williams entered Susie B. Moore.

Result—Flora	1	1
Susie B. Moore	3	2
Isola	4 dis.	
Alex. Barnes	5 dis.	
Transita	2 dis.	

WEDNESDAY, SEPTEMBER 11TH.

FIRST TRIAL.—*Trotting race*—Mile heats; three in five; free for all horses that have never shown better than 2:50; purse—one hundred and fifty dollars.

Entries—Roe Allen entered Roe Allen.
H. W. Seale entered Bracelet.
C. H. Shear entered Broderick.
Lute Oalds entered Moscow.

Result—Bracelet	4	1	3	2
Moscow	1	2	1	1
Roe Allen	3	3	2 dis.	
Broderick	2	4 dis.		

SAME DAY.

SECOND TRIAL.—*Trotting race*—Impromptu, in harness; mile heats; three in five; for a stake of one hundred dollars; inside purse, twenty-five dollars.

Entries—J. Smith entered Flying Cloud.
J. Jones entered Lilly.
F. Lusk entered Frank.

Result—Flying Cloud	1	1	1
Lilly	2	3	2
Frank	3	2	3

Time—First heat—2:47; second heat—2:47; third heat—2:49.

SAME DAY.

THIRD TRIAL.—*Trotting race*—Three-mile heats; free for all trotters; purse—four hundred dollars.

Entries—H. R. Covey entered Fillmore.
J. L. Eoff entered Lowry Matthews.
C. H. Shear entered Paddy Magee.

Result—Lowry Mathews	0	1
Paddy Magee	0	dis.

Time—First heat—8:10; second heat—8:14.

THURSDAY, SEPTEMBER 12TH.

FIRST TRIAL.—*Running race*—Mile and repeat; free for all; purse—two hundred and fifty dollars.

Entries—M. Hefferman entered James Glencoe.
R. T. O'Hanlon entered Shiloh.
C. S. Williams entered Nameless.
R. T. Leet entered Ten Broeck.
James Shelton entered Lilly Shotwell.

Result—Shiloh	2	4	dis.	
Lilly Shotwell	5	5	2	ruled off.
James Glencoe	1	3	dis.	
Nameless	4	2	1	2
Ten Broeck	2	1	3	1

Time—First heat—1:48¾; second heat—1:48 2-5; third heat—1:49; fourth heat—1:51 1-5.

SAME DAY.

SECOND TRIAL.—*Running race*—Two-mile heats; free for all three year olds; purse—four hundred dollars.

Entries—Thomas White entered Bloomsbury.
C. S. Williams entered Compromise.
J. E. Tyree entered Homely.

Result—Bloomsbury	1	1
Compromise	2	2
Homely	dis.	

SAME DAY.

THIRD TRIAL—*Trotting race*—Mile heats; three in five; free for all four year olds; purse—one hundred dollars.

Entries—F. M. Chapman entered Lady Washington.
A. F. Smith entered Sorrel Ned.
John Mackey entered Lady Stockton.

Result—Lady Stockton	1	1	1
Sorrel Ned	2	2	2
Lady Washington	3	3	3

Time—First heat—2:52½; second heat—3:10; third heat—2:59¾.

FRIDAY, SEPTEMBER 13TH.

FIRST TRIAL.—*Trotting race*—Mile heats; free for all; purse—four hundred dollars.

Entries—J. D. Lusk entered Sorrel Charley.
J. L. Eoff entered Lowry Matthews.
C. H. Shear entered Paddy Magee.

Result—Paddy Magee	1	1	1
Sorrel Charley	2	2	3
Lowry Matthews	3	3	2

Time—First heat—2:41; second heat—2:39; third heat—2:39.

SAME DAY.

SECOND TRIAL.—*Trotting race*—Mile heats; three in five; free for all; purse—one hundred and fifty dollars.

Entries—Daniel Dennison entered April Fool.
P. A. Finnegan entered H. H. Haight.
C. H. Shear entered John Conness.

Result—April Fool	2	1	1	1
H. H. Haight	3	3	2	2
John Conness	1	2	dis.	

Time—First heat—2:49¾; second heat—2:51¼; third heat—2:44; fourth heat—2:47¾.

SATURDAY, SEPTEMBER 14TH.

FIRST TRIAL.—*Race*—Five miles out; free for all trotters and pacers; purse—five hundred dollars.

Entries—E. G. Blessing entered Lady Don.
Barney Rice entered Dick Gough.
C. H. Shear entered Empress.
J. M. Daniels entered Fillmore.
J. L. Eoff entered Lowry Matthews.

Result—Lady Don..... 1
Dick Gough..... 2
Empress..... 3
Lowry Matthews..... 4
Fillmore..... 5

Time—First mile—2:47½; second mile—2:45½; third mile—2:45; fourth mile—2:43½; fifth mile—2:45¼=13:46¾.

SAME DAY.

Second Trial.—*Running race*—Mile heats; three in five; free for all; purse—four hundred dollars.

Entries—John Hall entered Isola.
R. T. Leet entered Flora.
Theodore Winters entered Alex. Barnes.
C. S. Williams entered Susie B. Moore.

Result—Flora.....	1	2	2	1	2
Susie B. Moore.....	2	1	1	2	1
Isola.....	3	4	dis.		
Alex. Barnes.....	4	3	3	dis.	

Time—First heat—1:50¼; second heat—1:50¾; third heat—1:51¼; fourth heat—1:50¼; fifth heat—1:53¼.

SAME DAY.

Third Trial.—*Running race*—Mile and repeat; free for all beaten horses; purse—two hundred dollars.

Entries—C. S. Williams entered Harmless.
A. Mesick entered Ellen Moore.
R. T. O'Hanlon entered Wilbur.
J. Hefferman entered James Glencoe.

Result—Harmless.....	2	4	4
Ellen Moore.....	1	2	3
Wilbur.....	3	1	1
James Glencoe.....	4	3	2

Time—First heat—1:49; second heat—1:52 2-5; third heat—2:02 3-5.

MONDAY, SEPTEMBER 16th.

First Trial—*Trotting race*—Mile heats; three in five; free for all trotters that have not shown better time than 2:44; purse—one hundred dollars.

Entries—C. H. Shear entered John Conness.
A. F. Smith entered Moscow.
D. Dennison entered April Fool.
Roe Allen entered Punch.

Result—John Conness	3	1	1	1
Moscow	2	2	2	2
April Fool	1	3	3	dis
Punch	4	dis.		

Time—First heat—2:46 1-5; second heat—2:45 1-5; third heat—2:42 4-5; fourth heat—2:36 1-5.

TUESDAY, SEPTEMBER 17TH.

FIRST TRIAL.—*Running race*—Three in five; purse—one hundred and fifty dollars.

Entries—A. Musick entered Ellen Moore.
Theodore Winters entered Lex.
D. Dennison entered Stonewall.

Result—Ellen Moore	1	1	1	
Lex	2	2	2	
Stonewall	3	3	dis.	

Time—First heat—1:51¾; second heat—1:53½; third heat—1:49½.

SAME DAY.

SECOND TRIAL.—*Trotting and Pacing race*—Mile heats; three in five; purse—one hundred dollars.

Entries—A. F. Smith entered Lady Don.
Chauncey Kane entered Honest Ance.
C. H. Shear entered Alicia Mandeville.

Result—Lady Don	1	2	1	2	1
Honest Ance	2	1	3	1	3
Alicia Mandeville	3	3	2	3	2

Time—First heat—2:41¾; second heat—2:45; third heat—2:42½; fourth heat—2:43; fifth heat—2:40¾.

PREMIUMS AWARDED IN 1867.

THOROUGHBRED HORSES.

Exhibitor.	Residence.	Animal.	Premium.
John Hall	Alameda	Best stallion, four years old and over—Woodburn	First—$50
John Hall	Alameda	Best stallion, two years old—Jonathan	First—$30
L. P. Marshall	Solano	Best stallion, one year old—Medoc	First—$20
Theodore Winters	Yolo	Best male colt—Margarita's foal	$15
John Hall	Alameda	Best mare, four years old and colt—Peggy Ringgold	$50
John Hall	Alameda	Best mare, four years old—Moss Rose	$40
Theodore Winters	Yolo	Best colt—Evadne's foal	$15

HORSES OTHER THAN THOROUGHBRED.

James A. Wheeler	Sacramento	Best stallion, with ten colts—George Moore, and colts—Ellen, John George W., Mark, Polly P., Ida, Lily, Nettie, Fanny, Queen and Betty Moore	$75
D. H. Lowrey	Sacramento	Best dam, with three colts—Queen—Colts — Golden Gate, Bell and Nelly	$40

HORSES OF ALL WORK.

Phil Borger	Amador	Best stallion, four years old and over—Selim	$40
John Dinwiddie	Yolo	Best stallion, three years old—Black Eagle	$30
Edward Roberts	Yolo	Best stallion, two years old—Harry Bluff	$20
J. C. Davis	Yolo	Best stallion, one year old—Young America	$15
C. P. Marsh	Contra Costa	Best mare, four years old and colt—Sally and colt	$40
Edward Roberts	Yolo	Best mare, four years old—Sally Miller	$30
J. C. Davis	Yolo	Best mare, three years old—Ellen Western	$20
J. C. Davis	Yolo	Best mare, two years old—Jenny Lind	$15
J. C. Davis	Yolo	Best mare, one year old—Lillie Gray	$10

GRADED HORSES.

Exhibitor.	Residence.	Animal.	Premium.
A. T. Leachman	El Dorado	Best stallion, four years old—Lexington	$40
David Frame	Sacramento	Best stallion, two years old—George W. Moore	$20
William H. Frye	Sacramento	Best stallion, one year old—Mark Moore	$15
James A. Wheeler	Sacramento	Best mare, four years old and colt—Julia and colt	$40
James S. Barnes	Sacramento	Best mare, three years old—Nettie Moore	$20
A. Parker	Yuba	Best mare, two years old—May Flower	$15
C. P. Marsh	Contra Costa	Best colt, under one year, without reference to sex—Hidi	$15

DRAFT HORSES.

Thomas Morgan	Solano	Best stallion, four years old—Black Prince	$30
D. H. Lowrey	Sacramento	Best mare, four years old—Queen	$25
D. H. Lowrey	Sacramento	Best mare, two years old—Belle	$15
D. H. Lowrey	Sacramento	Best mare, one year old—Nellie	$10

ROADSTERS.

S. B. Whipple	San Mateo	Best stallion, four years old—Hambletonian	$40
Thomas Fitzgerald	San Francisco.	Best stallion, three years old—Alexander	$30
H. R. Covey	San Francisco.	Best gelding, four years old—General Grant	$30
E. M. Skaggs	Sacramento	Best mare, four years old—Lady Belle	$30
S. B. Whipple	San Mateo	Best mare, three years old—Harvest Queen	$20
Thomas Fitzgerald	San Francisco.	Best mare, two years old—Lady Hanford	$15
H. W. Seale	Santa Clara	Best matched span carriage horses—Boston and George	$40
Edward St. Louis	Yolo	Matched span carriage horses—Monitor and Ulysses	Special diploma.
Master Covey	San Francisco.	Best matched span carriage ponies—Charles Hosmer and George Porter	Silver cup.
E. M. Skaggs	Sacramento	Best double team—Lady Belle and Lady Washington	$40
Leroy Whitman	Yolo	Best saddle horse—Pilgrim	$16

COLTS.

Charles H. Shear	Sacramento	Best yearling horse colt—Camp Union	$30
W. F. Swimley	Sacramento	Best sucking horse colt—Alaska	$20
W. B. Gibson	Yolo	Best sucking mare colt—Clydesdale	$15

SWEEPSTAKES.

Exhibitor.	Residence.	Animal.	Premium.
S. B. Whipple	San Mateo	Best stallion, of any age—Speculation.	$100
L. P. Marshall	Solano	Best mare, of any age—Ellen Jordan	$75

JACKS AND JENNETS.

John M. Laughlin	Sonoma	Best jack—Liberty	$50
Thomas Edwards	Sacramento	Best jennet—Lady Franklin	$40

DURHAM CATTLE.

Robert Branton	Solano	Best bull calf—Solano	$10
Robert Branton	Solano	Best cow, four years old and over—Pocahontas	$30
Robert Branton	Solano	Best cow, one year old—Lady Oxford	$15
M. H. Meagher	Sacramento	Best bull—Young Aaron	$15

DEVON CATTLE.

Seneca Daniels	Sonoma	Best bull, four years old and over—Loraine	$40
J. R. Rose	Sonoma	Best bull, two years old—Bloomfield	$20
J. R. Rose	Sonoma	Best bull calf—Bonaparte	$10
Seneca Daniels	Sonoma	Best cow, four years old and over—Curly	$30
J. R. Rose	Sonoma	Best cow, three years old—Fannie	$25
Seneca Daniels	Sonoma	Best cow, two years old—Nancy	$20
J. R. Rose	Sonoma	Best cow, one year old—Annie	$15

AYRSHIRE CATTLE.

Seneca Daniels	Sonoma	Best bull, four years old and over—Walter	$40
Seneca Daniels	Sonoma	Best bull calf—Walter second	$10
J. R. Rose	Sonoma	Best cow, four years old and over—Victoria	$30

GRADED CATTLE.

Exhibitor.	Residence.	Animal.	Premium.
J. J. Cook	Yolo	Best bull, four years old and over—Senator	$30
Robert Branton	Solano	Best bull, three years old—General Grant	$25
Seneca Daniels	Sonoma	Best bull calf—Medoc	$10
Robert Branton	Solano	Best cow, four years old and over—Tulip	$30
Robert Branton	Solano	Best cow, one year old—Star	$10

CATTLE SWEEPSTAKES.

J. R. Rose	Solano	Best bull of any age or stock—Bloomfield	$50
J. R. Rose	Solano	Best cow—Flora	$40

SHEEP—SPANISH MERINO.

J. D. Patterson	Alameda	Best ram, two years old—Pacific	$20
Roberts & Rawson	Solano	Best ram under two years old—Number Twenty-six	$15
Ellen McConnell	Sacramento	Best three ram lambs	$15
Thomas McConnell	Sacramento	Best three ewes, two years old	$15
Roberts & Rawson	Solano	Best three ewes, under two years	$15
J. B. Hoyt	Solano	Best five lambs	$15

FRENCH MERINO.

J. D. Patterson	Alameda	Best ram, two years old and over	$20
J. D. Patterson	Alameda	Best ram under two years old—Goliah	$15
J. D. Patterson	Alameda	Best three ewes, two years old and over	$15
J. D. Patterson	Alameda	Best three ewes under two years	$15
J. D. Patterson	Alameda	Best five ewe lambs	$15

SPANISH MERINO GRADES.

Thomas Cotter	Sacramento	Best ram, two years old and over	$15
Thomas Cotter	Sacramento	Best ram under two years	$10
Francis Graham	Sacramento	Best three ram lambs	$15
Francis Graham	Sacramento	Best three ewes, two years old and over	$10
Thomas Cotter	Sacramento	Best three ewes under two years	$10
Francis Graham	Sacramento	Best five ewe lambs	$10

SWEEPSTAKES.

Exhibitor.	Residence.	Animal.	Premium.
J. D. Patterson	Alameda	Best ram of any age or breed—Pacific	$25
J. B. Hoyt	Solano	Best ewe of any age or breed—Number Thirty-four	$20
Roberts & Rawson	Solano	Best five ewes of any age or breed	$25

CASHMERE GOATS.

J. H. Landrum	Stockton	Best thoroughbred goat—Bill Peters	$20
J. H. Landrum	Stockton	Best three kids	$15

SWINE.

N. Woodbeck	Sacramento	Best large breed boar, two years old and over—Cos	$15
N. Woodbeck	Sacramento	Best large breed boar under two years—Rube	$10
Joseph Gillis	Yolo	Best large breed boar under one year —Yolo Pet	$10
N. Woodbeck	Sacramento	Best large breed sow, two years old and over—Kitty	$10
E. F. Aiken	Sacramento	Best large breed sow, one year old—Dolly	$10
Amos Adams	Sacramento	Best pen of seven pigs	$20

POULTRY.

Exhibitor.	Residence.	Fowls.	Premium.
R. J. Merkley	Sacramento	Best exhibition by one person	$5
C. S. Lowell	Sacramento	Best lot black Spanish	$5
P. Burns	Sacramento	Best lot English magpie ducks	$5
R. J. Merkley	Sacramento	Best lot turkeys	$5
R. J. Merkley	Sacramento	Best lot English game chickens	$5
R. J. Merkley	Sacramento	Best lot Guinea fowls	$5
J. P. Odbert	Sacramento	Best lot India silk chickens	$5

MACHINERY, ETC.

Exhibitor.	Residence.	Article.	Premium.
Howland, Angell & King	San Francisco.	Hicks' patent steam engine	First—Diploma.
Goss & Lambard	Sacramento	Corliss engine	First—Diploma.
T. Hansbrow	Sacramento	Grinding and amalgamating pan	First—$25

Exhibitor.	Residence.	Article.	Premium.
Albert E. Redstone..	San Francisco.	Portable drag sawing machine.....	.....First—$10
Albert E. Redstone..	San Francisco.	Portable drag sawing mill.....	.....First—$20
John M. Benson.....	Sacramento....	Model steam engine.....	..... First—Diploma.
H. D. Pepper.....	Auburn.....	Model steam engine.....	..... First—Diploma.
James Sauze.....	Sacramento....	Model steam engine.....	.....Honorable mention.
Ferdinand Woodward.....	Sacramento....	Dredging machine, model snow plough and shovel, improved car wheel, improved locomotive driving wheel and oil box, car axle, gauge for centring round iron.....	.....Special—Diploma.
Union Iron Works..	San Francisco.	Dunbar's self-adjusting piston packing.....	..... First—Diploma.
Union Iron Works..	San Francisco.	Cross' patent boiler feeder and heater.....	..... First—Diploma.
Pioneer Woollen Mills.	San Francisco.	Loom for weaving fancy colors in woollen.....	..... First—Diploma.
W. T. Garratt.....	San Francisco.	California manufactured church bell	..... First—Diploma.
W. T. Garratt.....	San Francisco.	Steam siphon.....	.....Honorable mention.
F. A. Huntington...	San Francisco.	Shingle machine.....	..... First—Diploma.
Joseph Moore.....	San Francisco.	Moore's safety friction hoisting model	..... First—Diploma.
David Stoddard.....	San Francisco.	Stoddard's blacksmiths' drilling machine.....	.....Honorable mention.
Thomas Hansbrow..	Sacramento....	Well pump (hand).....	.....First—$3
W. D. Hooker.....	San Francisco.	Excelsior force pumps.....	.....Honorable mention.
M. & A. Wilcox.....	Sacramento....	Wilcox's water lifter for irrigating purposes.....	.....First—$10
Thomas Hansbrow..	Sacramento....	Mining pumps.....	.....First—$10
W. D. Hooker.....	San Francisco.	Steam pumps for fire engines and other purposes.....	.....First—$1
W. D. Hooker.....	San Francisco.	Harris' steam pump.....	.....Honorable mention.
David Stoddard.....	San Francisco.	Stoddard steam pumps.....	.....Honorable mention.
Pacific Saw Manufacturing Company.....	San Francisco.	Exhibit of circular, hand and mill saws, California manufacture.....	..... First—Diploma.
Riddell & Dunning..	San Francisco.	Manufactured and recut files.....	..... First—Diploma.
California Tool Company.....	San Francisco.	Home manufactured files.....	..... Special—Diploma.
Senatz & Knowlton.	Sacramento....	Oil concentrator.....	.....Honorable mention.
Senatz & Knowlton.	Sacramento....	Allenwood's hydraulic nozzle.....	..... First—Diploma.
J. H. Atkinson.....	San Francisco.	Car ventilator.....	.....Honorable mention.
Howland, Angell & King,.....	San Francisco.	Iron castings.....	..... First—Diploma.
Thomas Hansbrow..	Sacramento....	Hydraulic engine.....	..... First—Diploma.
G. K. Gluyas.....	San Francisco.	Stump and rock extractor.....	..... First—Diploma.
Huntington & Hopkins.....	Sacramento....	Holly pump.....	.....Honorable mention.
David Stoddard.....	San Francisco.	Exhibit brass work—Gifford's injectors, Pickering's governors, steam gauges, steam taps, etc.....	.....Honorable mention.
Goss & Lambard.....	Sacramento....	Exhibit of brass work, consisting of safety valves, throttle valves, steam whistles, etc.....	.....Honorable mention.
D. Hayes.....	.....	Hose clamps.....	..... First—Diploma.
A. S. Hallidie.....	San Francisco.	Wire rope machine.....	..... First—Diploma.
Dr. J. B. Beers.....	San Francisco.	Model wire gauze amalgamator.....	.....Honorable mention.
S. P. Roberts.....	San Francisco.	Avery's pump and well.....	.....Honorable mention.
N. W. Spaulding, agent for Pacific Saw Manufacturing Company.....	San Francisco.	Inserted tooth for circular saw.....	..... First—Diploma.
J. Stone.....	San Francisco.	Circular saw with Miller's patent teeth inserted.....	.....Honorable mention.

AGRICULTURAL IMPLEMENTS, ETC.

Exhibitor.	Residence.	Article.	Premium.
Hooker & Co	Sacramento	Pruning shears	Special—Diploma.
Baker & Hamilton	Sacramento	Hay and straw cutter	First—$5
Pacific Saw Manufacturing Co	San Francisco.	Reaping and mowing sections	First—Diploma.
Baker & Hamilton	Sacramento	Pitt's cylinder steam or horse power threshing machines	First—$20 and diploma.
P. O. Soper	San Francisco.	Improved hay knife	Special—Diploma.
Baker & Hamilton	Sacramento	Horse rake	First—$5
Baker & Hamilton	Sacramento	Buckeye cider mill	First—$10
Baker & Hamilton	Sacramento	Corn mill	First—Diploma.
W. M. Jackson	Woodland	Grain lifter	First—Diploma.
Baker & Hamilton	Sacramento	Best display agricultural machinery	First—$50
Charles Colby	San Francisco.	Double motion churn	First—Diploma.
Treadwell & Co	Sacramento	Lawn mower	Special—Diploma.
Treadwell & Co	Sacramento	Double shovel-plough	First—$2
J. F. Wilkinson	San Francisco.	Stump extractor	Special—Diploma.
Treadwell & Co	Sacramento	Fanning mill	First—$5
P. H. Murphy	Sacramento	Fowling & Bacon's grain sower and coverer	First—$10
Baker & Hamilton	Sacramento	Cultivator	First—$5
B. F. Cook	Napa	Model steam harvester, separator and thresher	Special—Diploma.
Hill & Knaught	Marysville	Broadcast seed sower	First—$10
Baker & Hamilton	Sacramento	Corn sheller and seed sower	Honorable mention.
Baker & Hamilton	Sacramento	Buckeye mower	First—$10
Baker & Hamilton	Sacramento	Harrow	First—$3
Baker & Hamilton	Sacramento	Best display of reaping and mowing machine knives	First—$5
J. F. Thompson	Lake County	Revolving harrow	Special—Diploma.
Treadwell & Co	Sacramento	Kerby's combined reaper and mower, with self-raking attachment	First—$10
Mattison & Williamson	Stockton	Horse fork	First—Diploma.
O. H. Jackson	Sacramento	Stubble plough	First—$10
O. H. Jackson	Sacramento	Vineyard plough	Special—Diploma.
Mattison & Williamson	Stockton	Gang of three ploughs	First—Diploma.
Mattison & Williamson	Stockton	Single three-horse ploughs	Special—Diploma.
Mattison & Williamson	Stockton	Gang of four ploughs, with seed sower attached	Special—Diploma.
J. H. Ingham	San José	Two-gang sulky ploughs	Special—Diploma.
Baker & Hamilton	Sacramento	Sod plough	First—$10
Baker & Hamilton	Sacramento	Double plough	First—$10
Baker & Hamilton	Sacramento	Cast iron plough	First—$10
Baker & Hamilton	Sacramento	Side-hill plough	First—$5
Baker & Bamilton	Sacramento	One-horse plough	First—$3
Baker & Hamilton	Sacramento	Best display and greatest variety of ploughs	First—$10
Robert Baxter	Stockton	Gang ploughs and sulky ploughs, with seed sower combined	Special—Diploma.
B. F. Ready	Sacramento	Steel-pointed cultivator	Special—Diploma.
P. H. Murphy	Sacramento	Hand rake, combined mower and reaper (Badger State)	Special—Diploma.
James Richmond	San Francisco.	Spoor's patent gate	Honorable mention.
Henry A. Gaston	Marysville	Lee's vertical picket farm gate	First—$3
L. Frink	Sacramento	Improved farm gate	Honorable mention.
Smith & Hanson		Patent gate	Special—Diploma.
J. S. Harbison	Sacramento	Beehive and beeswax	Special—$3
J. S. Harbison	Sacramento	Italian queen bees	Honorable mention.
Baker & Hamilton	Sacramento	Farm feed mill	First—$5
Treadwell & Co	Sacramento	Garden seed sower	Special—Diploma.
Treadwell & Co	Sacramento	Butter worker	Special—Diploma.
P. H. Murphy	Sacramento	Corn planter	Special—Diploma.

Exhibitor.	Residence.	Article.	Premium.
F. B. Lamb	San Francisco.	Williams' patent cogwheel wringer.	Special—$2
J. Whipple	Oroville	Hand churn	Special—Diploma.
David N. Phelps	Alameda	Improved squirrel trap	Honorable mention.
F. B. Lamb	San Francisco.	Pioneer washing machine	Honorable mention.

WAGONS, CARRIAGES, ETC.

J. A. Mason	Sacramento	Best two-horse family carriage	$25
J. A. Mason	Sacramento	Best light top buggy	Special—diploma
J. A. Mason	Sacramento	Best medium heft and spring buggy	Special—diploma
J. A. Mason	Sacramento	Best side spring bullion wagon	Special—diploma
J. A. Mason	Sacramento	Best light four-horse passenger wagon	Special—diploma
H. M. Bernard	Sacramento	Best top buggy	First—$15
H. M. Bernard	Sacramento	Best display of hubs and wheels	First—$5
H. M. Bernard	Sacramento	Best thoroughbraced wagon	Special—diploma
W. J. Robertson	Sacramento	Best farm wagon	Special—diploma
E. T. Meais	Sacramento	Best light four-horse farm wagon	First—$10
Hinckley & Co	San Francisco	Best Hayes' improved fire escape	Special—diploma
A. Searles	San Francisco	Best improved safety and anti-rattling shaft coupling	Special—diploma

SILK AND FABRICS MADE FROM CALIFORNIA SILK.

L. Prevost	San José	Best general exhibition of the silk business throughout, from the feeding of worms to the weaving of silk	First—$50
Joseph Neumann	San José	Best specimen of silk manufactured in California—not less than five yards	First—$20
Joseph Neumann	San José	Best specimen raw silk	First—$10
Joseph Neumann	San José	Best silk cravat	First—$10
Isoard & Muller	Nevada City	Best silk cocoons and best pound reeled silk made in family	First—diploma
DeWitt C. Flanklin	Los Angeles	Sample of silk cocoons	Honorable mention
Mr. Olevia	Hornitas	Sample of silk cocoons	Honorable mention
Miss M. Johnson	Sacramento	Sample of silk cocoons	Honorable mention
Mr. Tiffoinet	Columbia	Sample of silk cocoons	Honorable mention
S. Davis	Chinese Camp.	Sample of silk cocoons	Honorable mention
John Smith	Sacramento	Sample of silk cocoons	Honorable mention
Madam Sauffignon	San José	Sample of silk cocoons	Honorable mention
Mrs. Wilson Flint	Sacramento	Sample of silk cocoons	Honorable mention
Mrs. I. N. Hoag	Yolo	Sample of silk cocoons	Honorable mention
Mrs. A. M. Haynie	Sacramento	Sample of silk cocoons	Honorable mention
Mrs. G. A. Jones		Sample of silk cocoons	Honorable mention
J. E. Goux	Santa Barbara	Sample of silk cocoons	Honorable mention
James L. Ord	Santa Barbara	Sample of silk cocoons	Honorable mention
A. Packard	Santa Barbara	Sample of silk cocoons	Honorable mention

MILL FABRICS.

Mission Woollen Mills.	San Francisco	Best display of woollen goods by one manufacturer	First—$50
Oakland Cot'n Manufacturing Com'y	Oakland	Best display of cotton goods by one manufacturer	First—$50
Mission Woollen M'ls	San Francisco	Best ten yards woollen cloth	First—$5
Mission Woollen M'ls	San Francisco	Best ten yards cassimere	First—$5
Mission Woollen M'ls	San Francisco	Best ten yards flannel	First—$5
Mission Woollen M'ls	San Francisco	Best pair woollen blankets	First—$5
Pioneer Woollen M'ls	San Francisco	Best ten yards tweed	First—$5
Pioneer Woollen M'ls	San Francisco	Best assortment woollen shirts and drawers	First—diploma
Pacific Woollen M'ls	San Francisco	Best display of knit goods	First—$50

EMBROIDERY AND FANCY WORK.

Exhibitor.	Residence.	Article.	Premium.
Mrs. A. H. Cheeny	Sacramento	Hearth rug	First—$5
Mrs. Juliana Bayer.	Sacramento	Pair knit cotton stockings	First—$2
Miss M. H. Allmond.	Sacramento	Pair knit stockings by a Miss under twelve years of age	First—$2
Mrs. C. Blake	Washington	Pair worsted knit stockings	First—$2
Mrs. Chas. Crocker.	Sacramento	Carriage afghan	First—Napkin ring.
Mrs. Fred. Birdsell.	Sacramento	Carriage afghan	Special—Napkin ring.
Miss M. E. Coates	San Francisco.	Child's carriage afghan	First—Napkin ring.
Miss M. E. Coates	San Francisco.	Lounge robe	First—Diploma.
Mrs. J. L. Hummell.	Sacramento	Silk embroidery on flannel	First—Napkin ring.
Mrs. Dr. Simmons	Sacramento	Silk embroidery	Special—Napkin ring.
Miss Mary Hurd	Sacramento	Chenille embroidery	First—Napkin ring.
Mrs. M. E. Gerrish	San Francisco.	Wax flowers	First—Diploma.
Miss H. M. Brooks	Sacramento	Wax flowers	Special—Napkin ring.
Mrs. Julia Crew	Sacramento	Crochet tidies	First—Napkin ring.
Mrs. J. P. Odbert	Sacramento	Knit bedspread	First—$2
Martin L. Haas	San Francisco.	Best assortment white shirts made on machine	Special—Diploma.
Miss Alice Watson	Sacramento	Best tatting collars	First—Napkin ring.
Mrs. A. Wilcox	Sacramento	Tatting collars	Special—Napkin ring.
Mrs Foster and Miss Emmons	Sacramento	Millinery, bonnets, etc	First—Diploma.
Mrs. H. Wachhorst.	Sacramento	Millinery	Special—Diploma.
Miss M. E. Gerlash.	San Francisco.	Sofa pillow	First—Napkin ring.
Mrs. S. Sims	Sacramento	Sofa pillow	Special—Napkin ring.
Mrs. C. Cook	San Francisco.	Hair jewelry	First—Diploma.
Mrs. C. Cook	San Francisco.	Hair landscape	First—Diploma.
Mrs. P. Carolan	San Francisco.	Crochet shawl	First—Napkin ring.
Mrs. Jas. Carolan	Sacramento	Seaweed wreath	First—Napkin ring.
Mrs. Wm. Melvin	Sacramento	Seed wreath	First—Napkin ring.
Miss Julia Jones	Sacramento	Seed wreath	Special—Napkin ring.
Mrs. C. M. Hartwell.	Sacramento	Seaweed wreath	Special—Napkin ring.
Mrs. Kleinhans	Sacramento	Phantom bouquet	First—Napkin ring.
Colonel Warren	San Francisco.	Preserved natural flowers	First—Napkin ring.
Mrs. J. L. Hummell.	Sacramento	Embroidery stamping	First—Diploma.
Mrs. P. E. Finchley.	Sacramento	Theorem painting	First—Napkin ring.
Miss Massie Yost	Sacramento	Ottoman cover	First—Napkin ring.
Mrs. G. A. Putnam	Sacramento	Ottoman cover	Special—Napkin ring.
Mrs. G. W. Sanderson.	Sacramento	Cone frames	First—Diploma.
Mrs. Fred. Harford.	Lincoln	Cone frame	Special—Napkin ring.
Mrs. Len. Harris	Sacramento	Hair wreath	First—Napkin ring.
Mrs. C. F. Colton	Sacramento	Hair wreath	Special—Napkin ring.
Mrs. Juliana Bayer.	Sacramento	Bead work	First—Napkin ring.
Mrs. J. B. Murray	Sacramento	Bead work	Special—Napkin ring.
Mrs. Juliana Bayer.	Sacramento	Embroidered pictures	First—Napkin ring.

Exhibitor.	Residence.	Article.	Premium.
Mrs. H. B. Holland.	Sacramento....	Embroidered picture	...Special—Napkin ring.
Mrs. Juliana Bayer.	Sacramento....	Gold and silver embroidery	.....First—Napkin ring.
Mrs. G. C. Hall	Sacramento....	Embroidered chair seat	.....First—Napkin ring.
Miss Pauline Smith.	Sacramento....	Crochet mat	.....First—Napkin ring.
Miss Pauline Smith.	Sacramento....	Tidy	...Special—Napkin ring.
Miss M. E. Gerlash.	San Francisco.	Worsted mat	...Special—Napkin ring.
Mrs. Julia Bohl	Sacramento....	Patchwork quilt	.....First—Napkin ring.
Mrs. A. J. Lane	Sacramento....	Patchwork quilt	...Special—Napkin ring.
Mrs. Sarah Scudder.	Sacramento....	Silk patchwork quilt	.....First—Napkin ring.
Mrs. J. A. Lane	Sacramento....	Silk patchwork quilt	...Special—Napkin ring.
Mrs. E. Dodge	Sacramento....	Straw hat	..... .Honorable mention.
Miss A. Hummell	Sacramento....	Child's bead dress and flannel skirt.	.....First—Napkin ring.
Mrs. R. L. Jones	Sacramento....	Embroidery stamping	....Special—Napkin ring.
Mrs. R. L. Jones	Sacramento....	Models for cutting dresses	.....Diploma.
Mrs. M. Curtis	San Francisco.	Model for cutting children's and women's dresses, and boys' and men's clothing	.....First—Diploma.

HATS, CAPS AND FURS.

Meussdorffer & Co...	Sacramento....	Hats and caps	.....First—Diploma.
Adolph Muller	San Francisco.	Collection of furs	.....First—Diploma.

WIRE WORK, LEAD WORK, IRON AND TIN WARE, ETC.

H. T. Graves	San Francisco.	Screens, sieves, riddles, wire cloth, bonnet and hat stands and door plates	.....Special—Diploma.
H. T. Graves	San Francisco.	Patent rubber weather strips for doors and windows	..... Special—Diploma.
William H. Daffin	San Francisco.	Steel from the Philadelphia Steel Works	.....First—Diploma.
San F. Pacific Lead Pipe & Shot Works T. H. Selby & Co., Agents	San Francisco.	Display of shot, sheet and bar lead and lead pipe	..... First—Diploma.
R. C. Terry & Co...	Sacramento....	Tin and copper ware	.....First—Diploma.
R. C. Terry & Co...	Sacramento....	Lamps	.....Honorable mention.
Gillig, Mott & Co...	Sacramento....	Homemade tin ware	.....Honorable mention.
Gillig, Mott & Co...	Sacramento....	Danford's lamps	.....Special—Diploma.
H. Van Every	Sacramento....	Tin ware	.....Honorable mention.
T. J. McKim	Sacramento....	Best mining picks	..... First—Diploma.
J. McGuire	Sacramento....	Iron gate	.....Special—Diploma.

FURNITURE, ETC.

Goodwin & Co	San Francisco.	Best bureau	.....First—$5
Goodwin & Co	San Francisco.	Best sofa	.....First—$5
Goodwin & Co	San Francisco.	Best set parlor chairs	.....First—$5
Goodwin & Co	San Francisco.	Best set parlor furniture	.....First—$10
Goodwin & Co	San Francisco.	Best display of furniture	.....First—$10
Goodwin & Co	San Francisco.	Best sick chair	.....First—$3
Hasselgren & Wilson	Sacramento....	Best display of mattresses	.....First—Diploma.
J. Derby	San Francisco.	Best set school furniture	.....First—$3

Exhibitor.	Residence.	Article.	Premium.
Semas Tonner	San José	Rustic furniture	Special—Diploma.
N. P. Cole & Co	San Francisco.	Etegere	First—Diploma.
N. P. Cole & Co	San Francisco.	Cabinet work on California rose-wood parlor set	First—Diploma.
N. P. Cole & Co	San Francisco.	Chamber set	First—Diploma.
B. Essig	Sacramento	Improved bedstead fastening	Special—Diploma.
Goodwin & Co	San Francisco.	Turkish chair	Special—Diploma.

MANUFACTURES OF WOOD.

J. D. Boyd	San Francisco.	Samples of California laurel	First—Diploma.
A. Menke & Co	Sacramento	Willow ware	First—Diploma.
Laauser & Schafer	Sacramento	Wine casks	Special—Diploma.
Henry Ames	Sacramento	Doors and mouldings	Special—Diploma.
W. F. Frazier	Sacramento	Sugar pine plank	Special—Diploma.

CHEMICALS, DYE STUFFS, ETC.

Donnelly & Co	San Francisco.	Yeast powders, saleratus and bi-carbonate soda	First—Diploma.
Justin Gates & Bro.	Sacramento	Cream tartar	Special—Diploma.
Brigham & Crane	San Francisco.	Blue vitriol, highly commended	First—Diploma.
Henry Lake	San Francisco.	Boot blacking, highly recommended	First—Diploma.
Jacob Herkimer	San Francisco.	Water-proof harness blacking	First—Diploma.
C. F. Colton	Sacramento	Powder folder	Honorable mention.
Justin Gates & Bro.	Sacramento	Three cases perfumery, etc	Special—Diploma.
J. F. Fugazi	Sacramento	Hair dye, etc	Special—Diploma.
Weidemann & Wengenroth	Sacramento	Crystals de Paris	Special—Diploma.
C. H. Harrison	San Francisco.	Sample of whale and sperm oils	First—Diploma.
H. C. Megerle	Sacramento	Henry's citrate of magnesia powders	Special—Diploma.
J. J. Hucks	San Francisco.	California pitch	Special—Diploma.
J. J. Hucks	San Francisco.	Portable self-generating gas lamp	First—Diploma.
Hucks & Lambert	San Francisco.	Axle grease	Special—Diploma.
Pacific Oil and Lead Works	San Francisco.	Raw and boiled linseed oils and oil cake, California paint ground in oil	First—Diploma.
R. H. Withington	Sacramento	Five cases soap	First—Diploma.
E. & H. R. Ellery	San Francisco.	Patent India rubber cement and paint	First—Diploma.
Adams, McNeill & Co	Sacramento	California made candles	First—Diploma.
W. M. Kimber	Sacramento	White glue	Honorable mention.

LEATHER MANUFACTURES, ETC.

P. Kelley	San Francisco.	Best pair dress boots	First—Diploma.
P. Kelley	San Francisco.	Best pair heavy boots	First—Diploma.
P. Kelley	San Francisco.	Best pair gents' dress shoes	First—Diploma.
P. Kelley	San Francisco.	Best pair Congress gaiters	First—Diploma.
Buckingham & Hecht	San Francisco.	Best factory-made boots	First—Diploma.
Pacific Tanning and Boot and Shoe Co.	San Francisco.	Men's factory-made boots	Special—Diploma.

Exhibitor.	Residence.	Article.	Premium.
Pacific Tanning and Boot and Shoe Co.	San Francisco.	Ladies' factory-made boots and shoes	First—Diploma.
Pacific Tanning and Boot and Shoe Co.	San Francisco.	Display of leather	Special—Diploma.
L. Steudeman	Sacramento	Best ladies' gaiters (custom work)	First—Diploma.
L. Steudeman	Sacramento	Best ladies' slippers and bootees	First—Diploma.
J. Bray	San Francisco.	Best display of leather	First—Diploma.
J. Bray	San Francisco.	Display of lasts and shoemakers' tools	First—Diploma.
Francis Bannon	Sacramento	Hair bridle	Honorable mention.
Howland, Angell & King	San Francisco.	Hydraulic hose covering	Special—Diploma.
J. F. Stoll	Sacramento	Display of saddles and bridles	First—Diploma.
M. M. Cook & Son	San Francisco.	Display of leather hose, belting, collars, fire buckets, etc	First—Diploma.
Henry Powers	Sacramento	Display of collars	Honorable mention.
Feldman & Simpson	San Francisco.	Superior display of brushes	First—Diploma.
R. Ireland	Sacramento	Display of corn brooms	Special—Diploma.

BOOKS, STATIONERY, ETC.

T. Hart Hyatt	San Francisco.	Hyatt's Grape Culture	Special—Diploma.
S. P. Taylor & Co	San Francisco.	Display of paper manufactured in California	First—Diploma.
Edwards & Co	Sacramento	Case stationery	Special—Diploma.
Edwards & Co	Sacramento	Display bound account books	First—$5
Dewey & Co	San Francisco.	Layres' book, Elements of Composition, pioneer school books printed on the Pacific Coast	Special—Diploma.
A. Roman & Co	San Francisco.	Best display of printing	First—Diploma.
A. Roman & Co	San Francisco.	Forty-six copies Confucius' Chinese Classics, the first book made from stereotype plates in California	Honorable mention.
J. S. Hittell	San Francisco.	Resources of California	Special—Diploma.
F. Foster	Sacramento	Specimen bookbinding	Special—Diploma.
H. S. Crocker & Co.	Sacramento	Case stationery	Honorable mention.

STOVES, ETC.

Gillig, Mott & Co	Sacramento	Rubber belting	Honorable mention.
Gillig, Mott & Co	Sacramento	Best family cook stove "Good Samaritan"	First—Diploma.
R. C. Terry & Co	Sacramento	Wrought iron stove "Monitor" and kitchen furniture	Special—Diploma.
H. Van Every	Sacramento	Cook stove	Honorable mention.

MISCELLANEOUS.

B. R. Sweetland	Sacramento	Soda fountain	First—Diploma.
R. C. Terry & Co	Sacramento	Portable soda fountain	Special—Diploma.
Benicia Cement Co.	Benicia	Samples of water cement	First—Diploma.
Newman & Brannan S. F. Glass Works	San Francisco.	Exhibit of glass ware	First—Diploma.
C. Newman	San Francisco.	Patent self-sealing fruit jar	First—Diploma.
C. Newman	San Francisco.	Patent glass melting pot	First—Diploma.

Exhibitor.	Residence.	Article.	Premium.
Weil & Co	San Francisco.	Best exhibit California manufactured cigars	First—Diploma.
David Bush	San Francisco.	Patent fruit drying house	Honorable mention.
R. Ireland	Sacramento	Case of matches	Special—Diploma.
W. M. Stoddard	San Francisco.	Stoddard's patent tuck marker	Special—Diploma.
James L. Lord	San Francisco.	Staveless barrel	Special—Diploma.
Church & Clark	San Francisco.	Fine display of fireworks	Special—Diploma.
Adams, McNeill & Co	Sacramento	Samples sporting and blasting powder	Special—Diploma.
Howard & Coleman.	San Francisco.	Samples blasting and sporting powder	Special—Diploma.
A. Gaffanesch	Sacramento	Plants and bouquets	Honorable mention.
Mrs. D. A. DeMerritt	Sacramento	Eight beautiful verbena bouquets	First—Napkin ring.
Wm. Niedhardt	Sacramento	Artificial hands	Honorable mention.
J. L. L. F. Warren	San Francisco.	Artificial flowers, natural curiosities and collection of Japanese lilies	Special—Diploma.
E. Kimball	San Quentin	Crib-board made at California State Prison	Honorable mention.
Mrs. C. E. Atkinson	Folsom	Sample of cotton	Honorable mention.
Mrs. P. A. Stephens	Sacramento	Three ancient volumes and one piece ancient needle-work	Honorable mention.
Wm. M. Kimber	Sacramento	Kimber's kolsomine and porcelain wall finish	Honorable mention.
Joseph Francis	Sacramento	Model ship	Honorable mention.
A. Menke	Sacramento	Display of toys	Honorable mention.
James Knapp	Sacramento	Picture frame	Honorable mention.
Emma Kohler	Sacramento	Cotton and cactus plants	Honorable mention.
A. Menke	Sacramento	Sample of cotton	Honorable mention.
James Carolan	Sacramento	Show-case of sporting articles	Special—Diploma.
William Rudolph	San Francisco.	Gun lock	Special—Diploma.
W. C. Bussey	San Francisco.	Combination keyless lock	Special—Diploma.
Dewey & Co	San Francisco.	Combination wrench	Honorable mention.
Jeff. Wilcoxson	Yolo	Fine specimens of landscape	Honorable mention.
J. M. Frye	Sacramento	Very handsome specimens of malachite minerals from California and Siberia, and other minerals	Honorable mention.
Smith & Shaw	Colfax	Specimens of slate	Honorable mention.
Gustave Melsing	Virginia, Nev.	Three cases of minerals	First—Diploma.
E. L. Levey	San Francisco.	United States Fire Extinguisher	First—Diploma.
Mrs. M. Crissman	Sacramento	Best rugs	Napkin ring.

VEGETABLES, ETC.

J. G. Allmond	Sacramento	Drumhead cabbage	First—$2
J. G. Allmond	Sacramento	Egg plants	First—$3
J. G. Allmond	Sacramento	Pinkeye potatoes	First—$5
J. G. Allmond	Sacramento	Dutch cabbage	First—$2
J. G. Allmond	Sacramento	One half bushel sweet potatoes	First—$5
J. G. Allmond	Sacramento	Best pumpkin	First—$1
John Rider	Sacramento	One half bushel Neshannocks	First—$5
John Rider	Sacramento	One half dozen crook-necked squash	First—$2
Thomas Milgate	Sacramento	Display of tomatoes	First—$3
Mrs. I. N. Hoag	Yolo	One half dozen sugar beets, from seed imported from Germany	First—$2
Mrs. E. F. Aiken	Sacramento	One half peck castor oil beans	First—$4
A. Whelan	Sacramento	Best display of onions	First—$5
D. L. Perkins	Oakland	Display of sweet corn	First—$3
D. L. Perkins	Oakland	One half peck Lima beans	First—$2
L. S. Graham	Sacramento	Best exhibit squash	First—$4
A. Runyon	Sacramento	Best display of Mountain Sweet watermelons	First—$2
J. P. Odbert	Sacramento	Best display of other varieties of watermelons	First—$2

Exhibitor.	Residence.	Article.	Premium.
D. L. Perkins	Oakland	Best display of garden seeds—one hundred and twenty-five varieties.	First—$20
D. L. Perkins	Oakland	Best display dried beans	First—$5
R. Ireland	Sacramento	Best display broom corn	First—Diploma.
C. C. Knox for A. Finke	Sacramento	Best sack malt	First—Diploma.
Dutch Flat Water Company	Sacramento	Two bales timothy hay	Special—Diploma.
Robert Williamson	Sacramento	Best exhibit osage orange trees	Special—Diploma.
William G. Young	Plumas Co	Samples Scotch oats	First—$5
J. S. Harbison	Sacramento	Best ten pounds honey	First—$5
Neal & Clark	Sacramento	Best bale hops	First—$5
William M. Haynie.	Sacramento	Bale hops	Honorable mention.

BREAD, CAKE, ETC.

Mrs. W. M. Brooks.	Yolo	Best fruit cake	Special—Napkin ring.
Schroder & Fisher	Sacramento	Iceing and ornamental cake	Special—Diploma.
Nash & Clark	San Francisco.	Best soda crackers	First—$2
Nash & Clark	San Francisco.	Best sweet crackers	First—$2
Nash & Clark	San Francisco.	Best butter crackers	First—$2
Nash & Clark	San Francisco.	Best Boston crackers	First—$2
Nash & Clark	San Francisco.	Best picnic crackers	First—$2
Nash & Clark	San Francisco.	Best pilot bread	First—$2
Nash & Clark	San Francisco.	Water crackers	First—$2
Nash & Clark	San Francisco.	Milk crackers	First—$2
Nash & Clark	San Francisco.	Best Graham crackers	First—$2
Nash & Clark	San Francisco.	Best ginger crackers	First—$2
Miss Hattie Garfield.	Sacramento	Pound and sponge cake	Special—Napkin ring.
Miss J. M. Pierce	Sacramento	Best domestic bread and biscuit	First—$3
Mrs. E. F. Aitken	Sacramento	Best roll butter	First—$10
Mrs. P. Burns	Sacramento	Best June butter	First—$15

PRESERVES, PICKLES, ETC.

M. S. King	Sacramento	Best canned tomatoes	First—Diploma.
A. Bergman	Sacramento	Best canned peaches	First—$2
W. W. Marvin	Sacramento	Best canned pears	First—$3
W. W. Marvin	Sacramento	Best canned apples	First—$3
W. W. Marvin	Sacramento	Best canned quinces	First—$3
Mrs. J. P. Odbert	Sacramento	Best canned grapes	First—$3
M. S. King	Sacramento	Largest and best variety of canned fruit	First—$10
M. S. King	Sacramento	Largest and best varieties canned jelly	First—$10
A. Bergman	Sacramento	Largest variety pickles	First—$10
W. W. Marvin	Sacramento	Largest variety preserved fruit	First—$10
Mrs. J. P. Odbert	Sacramento	Best apple jelly	First—$3
Mrs. M. Crissman	Sacramento	Best currant jelly	First—$3
Mrs. J. P. Odbert	Sacramento	Best peach jelly	First—$3
Mrs. J. P. Odbert	Sacramento	Best quince jelly	First—$3
Mrs. W. W. Marvin.	Sacramento	Preserved quinces	First—$3
Mrs. W. W. Marvin.	Sacramento	Preserved peaches	First—$3
Mrs. W. W. Marvin.	Sacramento	Preserved pears	First—$3
Mrs. I. N. Hoag	Yolo	Preserved plums	First—$3
Mrs. I. N. Hoag	Yolo	Pickled peaches	First—$3
Mrs. Flanders	Yolo	Tomato catsup	First—$3
A. Bergman	Sacramento	Best pickled cucumbers	First—$3
Mrs. H. Cronkite	Sacramento	Best pickled onions	First—$3

Exhibitor.	Residence.	Article.	Premium.
Mrs. H. Cronkite....	Sacramento....	Best pickled gherkins.....	.....First—$3
Mrs. H. Cronkite....	Sacramento....	Best elderberry jam.....	...Special—Napkin ring.
D. Clarman.....	Sacramento....	Best concentrated milk.....	.....First—$3
Mrs. W. W. Marvin.	Sacramento....	Preserved tomatoes and grapes.....	.....Special.
Mrs. H. Van Every.	Sacramento....	Plum jelly	.....Special.
A. Bergman.....	Sacramento....	White vinegar.....	...Special—Napkin ring.
Colusa Flour Mills..	Sacramento....	Best flour.....	..... Diploma.

WINES AND LIQUORS.

M. Keller	San Francisco.	Best white still wines, two years old.	.....Special.
Isador Landsberger.	San Francisco.	Best white still wines, two years old.	.....Special—Diploma.
C. Detten	Stockton.....	White still wine, one year old.....	.....First—$10
Isador Landsberger.	San Francisco.	Red still wine, two years old.....	.....$10
Isador Landsberger.	San Francisco.	Red still wine, two years old.....	.....$10
Isador Landsberger.	San Francisco.	Sparkling wines, one year old.....	.....$10
H. Eberhardt.....	San Francisco.	Sparkling wine.....	.....Special—Diploma.
C. Detten.....	Stockton.....	Port wine.....	.....First—$10
B. N. Bugbey.....	Folsom.	Claret wine from foreign grapes.....	.....First—$10
Thos. Pettinelli	Napa	Sherry wine.....	.....First—$10
B. N. Bugbey.....	Folsom.....	Exhibit of wines from foreign grapes	.....First—$10
Isador Landsberger.	San Francisco.	Exhibit of wines from native grapes.	.....First—$10
C. F. Scholl	Marysville.....	Brandy from grapes, three years old.	.....First—$10
B. N. Bugbey.....	Folsom.....	Grape brandy, two years old.....	.....First—$10
William Mace.....	Sacramento....	Grape brandy, one year old.....	... .First—$10
West Bros	Stockton.....	Port wine, one year old.....	.....Special—Diploma.
B. N. Bugbey.....	Folsom.....	Wines from Catalyac, Johannisberg, Reisling and Orleans grapes.....	.....Special—Diploma.
H. Eberhardt.....	San Francisco.	Peach brandy, seven years old.....	.....Special—Diploma.
M. Keller.....	San Francisco.	California wine bitters.....	.....Special—Diploma.
E. P. Cassin.....	San Francisco.	Grape brandy bitters.....	.....Special—Diploma.
L. Lacour.....	San Francisco.	Sarsapariphere bitters.....	.....Special—Diploma.
C. F. Scholl.....	Marysville.....	Best Angelica wine.....	.....Special—Diploma.
S. Marks.....	San Francisco.	California draught ale.....	.....Special—Diploma.
S. Marks.....	San Francisco.	Best bottled porter.....	.....Special—Diploma.
P. Arnold.....	Collinsville.....	White wine of 1866.....	.....Honorable mention.

FRUITS.

William Flanders....	Yolo.....	Best collection of apples.....	.....Special—Diploma.
A. Runyon.....	Sacramento....	Best forty varieties apples.....	.....First—$20
C. W. Reed.....	Yolo.....	Best twenty varieties apples.....	.....First—$15
E. Pierce.....	Sacramento....	Best ten varieties apples	.....First—$10
C. W. Reed....	Yolo	Best twenty varieties pears.....	.....First—$15
A. Runyon.....	Sacramento....	Best ten varieties pears.....	.....First—$10
E. M. Smith.....	Coloma.....	Best twelve varieties peaches.....	.....First—$10
M. S. Hurd....	Sacramento....	Best seedling peaches.....	.....Special—Diploma.
L. S. Graham.....	Sacramento....	Best one variety peaches.....	.....First—$3
Mrs. W. H. Brooks.	Yolo.	Best one variety plums.....	.....First—$3
Mrs. I. Lohman.....	Sacramento....	Best one dozen apple quinces.....	.....First—$5
L. J. Burrell.....	Santa Cruz and Santa Clara...	Largest variety native grapes.....	.....First—$10
E. M. Smith.....	Coloma.....	Largest variety foreign grapes.....	.....First—$10
B. N. Bugbey.....	Folsom.....	Best one variety Tokay grapes.....	. .....First—$3
A. Runyon.....	Sacramento....	Best variety grapes for table raisins and wine.....	.....First—$5
Mrs. C. E. Atkinson.	Folsom.....	Best variety figs.....	.....First—$3
R. Ketchum.....	Bidwell's Bar.	Best variety oranges.....	.....First—$3
T. K. Stewart.....	Sacramento....	One variety sweet oranges.....	.....Special—Diploma.
B. N. Bugbey.....	Folsom.....	Best twenty-four pounds raisins.....	.....First—$15

NUTS.

Exhibitor.	Residence.	Article.	Premium.
A. Gaffanesch	Sacramento	Best half peck English walnuts	First—$3
J. G. Allmond	Sacramento	Best black walnuts, half peck	First—$5
A. Whelan	Sacramento	Best half peck peanuts	First—$2
Kimball & Cutting	Calaveras	Best Japanese chestnuts	Honorable mention.
E. Pierce	Sacramento	Best half peck soft shelled almonds.	First—$3

PAINTINGS, PHOTOGRAPHS, ETC.

Norton Bush	San Francisco	Best oil painting by California artist	First—$20
H. Fletcher	San Mateo	Best painting in water colors	First—diploma
J. A. Todd	Sacramento	Best plain photograph, life size	First—$15
Mrs. M. E. Gerrish.	San Francisco	Decalcomania painting	Honorable mention
H. Fletcher	San Mateo	Best flower painting	First—$10
Norton Bush	San Francisco	Best landscape painting in oil, by California artist	First—$10
E. F. Oatman	Sacramento	Best penmanship	First—diploma
H. Fletcher	San Mateo	Best pen drawing	First—diploma
Silas Selleck	San Francisco	Best plain photograph	First—$10
William Shew	San Francisco	Best photograph in water colors	First—$15
William Shew	San Francisco	Best photograph in India ink	First—$10
William Shew	San Francisco	Best plain porcelain picture	First—$15
William Shew	San Francisco	Best colored porcelain picture	First—$10
Miss Ada Calley	Sacramento	Best pencil drawing	First—napkin ring
Silas Selleck	San Francisco	Cabinet photographs	Special—diploma
J. H. Pierce	Sacramento	India ink and business card lettering	Special—diploma
A. B. Bowers	Sonoma	Lithographed and colored map of Sonoma County	Special—diploma
Mrs. H. K. Snow	Sacramento	Medley picture	Honorable mention
W. C. Holman	Oregon	Map of the world	Honorable mention
Miss Mattie Wood	Sacramento	Two medley pictures	Honorable mention
Miss Buckmaster (Principal)	San Mateo Institute.	Three maps and five pictures by the students	Honorable mention

MARBLE WORK.

J. C. Devine & Bro.	Sacramento	Best collection of marble work	First—$30
J. C. Devine & Bro.	Sacramento	Best sculpture	First—$10
Aitken & Co	Sacramento	Best California marble	First—$5
Aitken & Co	Sacramento	Best work in California marble	Special—diploma

MUSICAL INSTRUMENTS.

Exhibited.	Residence.	Article.	Premium.
L. K. Hammer	Sacramento	Best grand piano (Chickering)	First—$20
L. K. Hammer	Sacramento	Best square piano (Chickering)	First—$20
L. K. Hammer	Sacramento	Best Mason & Hamlin organ	First—$10
L. K. Hammer	Sacramento	Best melodeon	First—$5
L. K. Hammer	Sacramento	Best set brass instruments	First—$5
L. K. Hammer	Sacramento	Best set clarionets	First—$5
L. K. Hammer	Sacramento	Best set violins	First—$20
L. K. Hammer	Sacramento	Best cithara	Honorable mention
L. K. Hammer	Sacramento	Best leaf turner	Honorable mention
R. C. Marsh	Sacramento	Best California manufactured guitar	First—diploma
J. G. Davis	San Francisco	Best piccolo	First—diploma
J. G. Davis	San Francisco	Best flute	First—$5

ESSAYS.

William M. Haynie.	Sacramento	Best essay on the cultivation and curing of hops	First—$50
William M. Haynie.	Sacramento	Best essay on silk culture in California	First—$50

REPORTS OF COMMITTEES OF AWARD.

Many of the committees handed in their awards unaccompanied by other than verbal reports. The following reports were presented in writing, and will be found of interest:

MACHINERY.

To the President of the State Agricultural Society:

SIR: Your Committee on Machinery would respectfully report that they have given as careful an examination to the articles placed upon the list as the time allotted to them will permit.

In relation to steam engines, we would report that it is difficult to determine as between two engines, both claiming a premium, unless we could see tests by the indicator, with exact data as to the fuel consumed and work performed. These your Committee could not have. We therefore make our awards based upon an examination of the principles of construction, and the appearance and action of the engines while in the performance of work.

We award a first premium to Hicks' patent steam engine, entered by Howland, Angell & King, of San Francisco, for simplicity of construction, economy in space, facility for transportation and the little experience necessary to operate it, and recommend it for use in mining, hoisting, saw mills and other places where simplicity of design and small liability to get out of repair are considered advantages.

We also award a first premium to the Corliss engine, Goss & Lambard of Sacramento, for economy in the use of fuel, for the ease and certainty with which its motions can be regulated, and recommend it for mining mills, flouring mills and heavy work.

Redstone's portable drag sawing machine and mill, we recommend for first premiums, for originality, simplicity and the effective manner in which it works.

We recommend as worthy of honorable mention Redstone's model steam engine, for originality of design and the effective simplicity with which reciprocating is converted into rotary motion.

We also recommend a model shingle machine by the same inventor as worthy of consideration for originality of design and apparent utility.

We also desire to call attention to three model engines, by James M. Benson, James Sauze and H. D. Pepper, as commendable for workmanship—particularly those of Pepper and Benson.

Mr. Ferdinand Woodward has on exhibition:

A guage for centring round iron.

A dredging machine for removing sand bars in rivers.

A model snow plough and shovel.

Improved car wheel.

Improved locomotive driving wheel.

Oil box and car axle.

We desire to call attention to these various inventions and improvements as exhibiting originality of thought, and many of them as being worthy of practical experiment.

Dunbar's patent self-adjusting piston packing, exhibited by Union Iron Works, is well known as the most economical and efficient packing yet invented.

Cross' patent boiler feeder and heater are worthy of a first premium, as being the best, most practical and effective inventions for heating and purifying water for use in steam boilers.

We recommend a circular saw and table, exhibited by Baker & Hamilton, as worthy of honorable mention.

We also desire to call attention to a loom for weaving fancy colors, exhibited in operation by the Pioneer Woollen Mills, and would recommend the award of a premium for the best weaving apparatus on exhibition. The interest this company have manifested in the success of the exhibition is highly commendable.

We recommend a first premium to W. T. Garratt, for church bells of California manufacture, and of superior tone and workmanship.

We would also recommend for honorable mention the steam siphon, exhibited by the same gentleman.

We award to T. A. Huntington the first premium for shingle machine, and recommend it for rapidity and the perfection of its operations.

We consider worthy of honorable mention Moore's safety friction hoisting model.

We award a first premium to Thomas Hansbrow, for his Planet Amalgamating Pan.

We recommend as worthy of honorable mention, Stoddard's blacksmith's drilling machine, and recommend it as a practical machine for heavy work by hand power.

We find a premium to be awarded by the society for portable steam engines. There is but one on exhibition—from Baker & Hamilton. If of California manufacture, we award a first premium.

We award a first premium for the best well pump, to be used by hand or other power, to Thomas Hansbrow.

We would also recommend Hooker's hand pump as worthy of general use.

We award a first premium to Wilcox's water lifter, as the apparatus for irrigating purposes.

We award a first premium to Thomas Hansbrow's mining pumps for raising water from mines.

We award a first premium to Hooker's steam pump for fire engines and other purposes, and recommend it for simplicity and rapidity of motion.

We also desire to call attention to Harris' steam pump, for its effective work and the simplicity of its valves.

Stoddard's steam pumps on exhibition also performed good work, and are easily managed.

We award a first premium to the Pacific Saw Manufacturing Company for the best exhibit of saws of California manufacture, and recommend their work for its superior temper and finish.

We award to Riddell & Dunning a first premium for files, manufactured and recut.

We also recommend to favorable consideration the files of the California Tool Company.

We desire to call attention to Senatz & Knowlton's concentrator, for concentrating ores, and recommend it as having the appearance of being effective and economical.

We also desire to call attention to, as being worthy of adoption, Allenwood's nozzle for hydraulic mining.

We recommend, as worthy of adoption, J. H. Atkinson's car ventilator as being original in design, and as having the appearance of being practically effective.

We award a premium to Messrs. Howland, Angell & King, for the best iron casting.

We award to Thomas Hansbrow a first premium for the best hydraulic engine, and recommend it as the most economical water power where a pressure can be had.

We award a premium to G. K. Gluyas, for the best stump and rock extractor and elevator.

We would recommend for favorable mention the Holly pump, exhibited by Huntington & Hopkins.

We would recommend for honorable mention the exhibit of brass work —Gifford's injectors, Pickering's governors, also steam guages, steam traps, etc.—as being of superior utility and workmanship, exhibited by David Stoddard.

We award a first premium to Messrs. Goss & Lambard, for the best exhibit of brass work of their own manufacture, consisting of safety valves, throttle valves, steam whistles and other superior work.

We would award a first premium to D. Hays, for the best hose clamp, and would especially recommend it to the Fire Department as an important and useful invention.

We would award a first premium to A. S. Hallidie, for the best wire rope machine, and would recommend it as an important and highly useful machine, producing very superior work.

We would recommend for honorable mention Dr. J. B. Beers' model of a wire gauze amalgamator, and would consider it as worthy of practical experiment.

We would recommend for honorable mention Avery's pump and well, exhibited by S. P. Roberts.

All of which is respectfully submittted.

J H. GRAVES, Chairman,
For Committee.

FIRE EXTINGUISHER.

SACRAMENTO, September 14, 1867.

To the State Board of Agriculture:

GENTLEMEN: Your Committee appointed to examine and report upon "The United States Fire Extinguisher," now exhibited at the California State Fair by E. Levey, of San Francisco, respectfully report, that we have made a thorough examination of the apparatus referred to, and have subjected it to a practical test, with the most satisfactory results.

The Extinguishers under examination are of three sizes. They are constructed of thin boiler iron, and are all tested under a pressure of two hundred pounds to the square inch, but are used under a pressure of about forty pounds to the inch. Number One is eight inches in diameter and twenty-two inches in height; weight, when charged, about fifty pounds. Number Two is nine inches in diameter and twenty-six inches in height; weight, about seventy pounds. Number Three is eleven inches in diameter, thirty inches in height; weight, about ninety pounds. All are cylindrical in form, and each is supplied with shoulder-straps, by means of which it is readily taken upon the back of the operator; and also with a small hose and branch pipe, through which the contents of the Extinguisher are applied to the fire. In preparing the Extinguisher for use, the main cylinder is filled with water and an interior chamber is charged with tartaric acid and soda. When once so charged it will remain many years, as is claimed by the exhibitor, ready for instantaneous use. When necessity requires, the operator places the Extinguisher upon his back and takes such position relative to the fire as circumstances may permit. The hose, which is about four feet long, a half inch in diameter and made of gutta percha, is supplied with a stop cock, by means of which he controls the fluid in the cylinder. When this is opened, a small but forcible stream is thrown from the apparatus, propelled by the expansive power of the gas within. In close proximity to the fire the stream may, of course, be directed to the best advantage and with the greatest effect, but it can be applied successfully at a distance of forty or fifty feet.

For the purpose of giving the Extinguisher a practical trial, two frame buildings were erected yesterday at the Stock Grounds, each about ten feet square and nine feet high. Inside of each an empty tar barrel and a quantity of shavings and lumber were placed for the purpose of starting the fire. At eight and one half o'clock in the evening, in the presence of your Committee and several hundred citizens, these buildings were successively fired. The first one had become thoroughly ignited in the interior when Mr. Levey and his two assistants, each with an Extinguisher on his back, advanced and, through the open door and windows, threw upon the fire their respective streams. It was at once evident that the effect was much greater than could have been produced by the application of the same quantity of water in its ordinary condition. In two or three minutes the fire was subdued, and in four or five minutes embers and all were extinguished. It was determined, however, by the Committee to make a more thorough test of the other building. The interior of this was, therefore, partially saturated with turpentine. The fire was started and was permitted to burn until the house became enveloped in flames inside and out. When Chief Engineer Gillen gave the order, Levey and his assistants advanced and brought their appar-

atus to bear on the flames. The heat was great, and for a few moments the result seemed to be uncertain. All doubt, however, was quickly dispelled. In five or six minutes the flames and embers were completely extinguished. The result was entirely satisfactory to your Committee, as it evidently was to the spectators present, from the hearty cheering with which the operators were greeted. It was observable that they did not direct their streams to the roof or upper portion of the building, but applied them to the base of the fires. The gas arising from the fluid discharged successfully smothered the flames above. When these experiments were tried a moderate breeze was blowing, and as there were open doors and windows left in each building, the flames were subjected to a strong draft. It would be almost impossible for any fire to gain such headway or to burn to such advantage in any single room in a building, or in any portion of a ship below decks, as in the case of the last experiment witnessed by your Committee.

In conclusion, we have no hesitation in reporting that the Extinguisher, for the purpose for which it is designed—the extinction of fires in their earlier stages—is an invaluable invention, and one which must result, if brought into general use, in a great saving of property and consequent benefit to the community at large. We therefore respectfully recommend to the Board the award of a special premium to the exhibitor adequate to the importance of the invention on exhibition.

WILLIAM GILLEN,
Chief Engineer Sacramento Fire Department,
JULIUS WETZLAR,
CYRUS S. COFFIN,
D. W. EARL,
PASCHAL COGGINS,
Committee.

TEXILE FABRICS—SILK.

SACRAMENTO, September 18th, 1867.

To the President and Board of Directors, State Agricultural Society.

GENTLEMEN: The undersigned, appointed a Committee to act as judges in making awards on articles exhibited at the State Fair in Section 33, Class 1, in the Third Department, hereby respectfully present their report:

We award to L. Prevost, for best general exhibition of the silk business throughout, from the feeding of the worms to the weaving of silk goods, the first premium of fifty dollars.

We award to Joseph Neumann, for best specimen of silk manufactured, not less than five yards, the first premium of twenty dollars.

Also, to the same party, for best specimen of raw silk, the first premium of ten dollars.

Also, to the same party, for the best silk cravat, the first premium of ten dollars.

We award to Mrs. Miller of Nevada City, for the best pound reeled silk made in family, the first premium of ten dollars.

In closing our report we will state that from the data given us by the

parties exhibiting "silk and fabrics made from California silk" and from other sources, we feel it our duty to congratulate the people of California on the evident progress which has been made within the last year in this State in these most important branches of domestic industry. We are confident that this progress is not ephemeral, but is the result of practical knowledge on the part of culturists and manufacturers, and that a new and profitable source of labor is to be firmly established among our people, to their moral and pecuniary benefit, and that the representations of silk culturists at the State Fair of eighteen hundred and sixty-eight will convince the most skeptical.

HORACE D. DUNN,
W. B. EWER,
J. LIPMAN,
G. C. HALL,
PASCHAL COGGINS,
Committee.

AGRICULTURAL IMPLEMENTS AND MACHINERY

To the President and Directors of the State Agricultural Society:

The Committee appointed to award premiums in the department of agricultural implements and machines would respectfully report, that in the order of our business we were first called upon to decide the merits of the different mowing machines. There were but three entries made:

Kirby's combined mower and reaper, cutting fifty-five inches, by Treadwell & Co., Sacramento.

Buckeye No. 2, combined mower and reaper, cutting fifty-five inches, by Baker & Hamilton, Sacramento.

Badger State mower, cutting fifty-two inches, by P. H. Murphy, Sacramento.

A grand trial of the machines was had on September eleventh, at the Park Ground—the inclosure there being covered with a heavy growth of Chile clover—which was calculated to severely test the strength and capacity of the machines. About one acre of ground was marked off as a task for each, and the Kirby and Buckeye started in, each apparently confident of success. They both did the work well, with but few balks, and little stopping or clogging. The Badger State, after the first round, was withdrawn from the field, the work evidently being too heavy for it.

The day following the trial the ground was carefully examined by the Committee, and the following decision agreed upon:

For light draft, durability, superior workmanship and adaptability to the general wants of California farmers, we award the first premium to the Buckeye No. 2.

Your Committee were next called to decide upon the merits of the different ploughs entered for premiums, to be decided by trial, the ploughing match to come off at the Park on the twelfth of September.

The entries were as follows:

First entry, by Ready Bros., of Sacramento, three-gang.

Second entry, by O. H. Jackson, of Sacramento, two-gang.

Third entry, by H. Cronkite, of Sacramento, three-gang.

Fourth entry, by Matteson & Williamson, of Stockton, three-gang and four-gang ploughs, double-edged reversible mouldboard.

Fifth entry, by J. H. Ingham, a two-gang sulky plough.

With the latter every one present was much pleased. It did its work well and gave general satisfaction, the driver on the seat having complete control of the ploughs, raising and lowering by means of a crank and cogwheel gearing.

The different ploughs were drawn by the same team, and in the order of the entries; and to the farmers present, and there were many, the match was considered one of the most interesting and exciting features of the exhibition. The trial of ploughs at the Park Ground, on account of the sandy nature of the soil, and being covered somewhat with weeds, was not satisfactory to the Committee nor to the owners of the different ploughs, and it was therefore decided to have another trial the following day, a few blocks northeast of the Park, on the bed of the old slough, on a clean, moist clay soil. A great many were present at this trial—which was conducted in the same order as the preceding one, giving general satisfaction to all present.

Your Committee award the first premium to Matteson & Williamson, of Stockton, for simplicity of construction, cheapness and durability of their double-edged, reversible mouldboard three and four gang plough, and for light draft and good work.

—— BAKER,
E. F. AITKEN,
MOSES SPRAGUE,
J. W. HAINES.

MILL FABRICS—COTTON.

SACRAMENTO, September 18th, 1867.

To the President and Board of Directors of the State Agricultural Society:

GENTLEMEN: The undersigned Committee of Judges appointed to make awards on mill fabrics in the Third Department, Section 34, Class 2, of the State Fair, respectfully submit this their report. They award as follows:

Mission Woollen Mills, San Francisco, for best display of woollen goods by one manufactony, first premium, $50.

Oakland Cotton Manufacturing Company, for best display of cotton goods by one manufactory, first premium, $50.

Mission Woollen Mills, San Francisco, for best ten yards woollen cloth, first premium, $5.

Mission Woollen Mills, San Francisco, for best ten yards cassimere, first premium, $5.

Mission Woollen Mills, San Francisco, for best ten yards of flannel, first premium, $5.

Mission Woollen Mills, San Francisco, for best pair woollen blankets, first premium, $5.

Pioneer Woollen Mills, San Francisco, for best ten yards tweed, first premium, $5.

Pioneer Woollen Mills, San Francisco, for the best assortment of woollen shirts and drawers exhibited, a first premium.

HORACE D. DUNN,
S. LIPMAN,
G. C. HALL,
J. T. GRIFFITTS,
Committee.

HOUSEHOLD FABRICS.

SACRAMENTO, September 18th, 1867.

To the President and Board of Directors of the State Agricultural Society:

GENTLEMEN: The undersigned Committee, appointed as Judges to make awards in the Third Department, Section 36, Class 4, household fabrics, exhibited in the State Fair, respectfully present the following as their report, viz:

To Mrs. A. M. Cheney, Sacramento, for best hearth rug, first premium, $5.

To Mrs. Juliana Bayer, Sacramento, for best pair cotton knit stockings, first premium, $2.

To Miss Mary H. Allmond, Sacramento, for best pair knitted stockings, by a Miss under twelve years of age, first premium, $2.

To Mrs. C. Blake, Washington, Yolo County, for best pair worsted knit stockings, first premium, $2.

To Mrs. J. P. Odbert, Sacramento, for best knit bedspread, first premium, $2.

The above named articles were the only ones in the class above referred to which are entitled to premiums.

There being no provision made in the published premium list for display or exhibit of knit goods made by machinery, your Committee were instructed to add that class of articles to their department and make recommendations for awards for same. They therefore recommend the awarding to the Pacific Woollen Mills, San Francisco, for best display of manufactured knit goods, the same premium as is given to the Mission Woollen Mills, viz: $50.

The Committee, in view of the superior excellence and great variety of articles made, and the importance of this new branch of manufactures as an industry much needed in the State, do earnestly recommend the same to the favorable consideration of the Committee to award gold medals. It is the most important industry in the Third Department, for the following reasons: Its field of operations—about $3,000,000 worth of knit goods being imported yearly to the Pacific States and Territories. Its scope of manufacture—every variety of men's, women's and children's wear to be made by this company, which is not the case with the other woollen mills. A new field for women's labor, by which mothers can work at home with their families, earning remunerative wages. Also, for the larger amount of labor in its value of manufactures as compared with other industries, the proportion being fully ten dollars paid to the operative where three dollars is paid in other woollen manufactures for the same value of goods made. Its effect in stimu-

lating the production of fine-woolled sheep, it using the very finest of wool, which is not the case with other woollen manufactures in this State. We believe the above reasons, though briefly stated, to be those which should entitle the Pacific Woollen Mills to the gold medal to be awarded in the Third Department, and commend them to the Committee who are to make the award.

The Committee recommend a special premium to M. L. Haas, for "pearl" shirts, for excellence of work and materials used, and as an encouragement of a most valuable and important branch of industry now in its infancy.

HORACE D. DUNN,
S. LIPMAN,
G. C. HALL,
J. T. GRIFFITTS,
Committee.

CABINET WARE.

To the President and Directors of the State Agricultural Society:

GENTLEMEN: In this department there is quite a number of exhibitors, and the articles on exhibition are a credit to the skill and taste of the workmen in this State. In some cases not only the material but a large part of the work is to be credited to the Eastern States. Where this is not the fact the Committee have endeavored to give our State credit.

Among the articles on exhibition we notice the Boston furniture exhibited by Mr. Hopley, agent, consisting of a black walnut chamber set, a parlor set of antique pattern and finish, a spring bed of excellent material and a superior hair mattress.

Semas Tonner, of San José, has a variety of rustic chairs and a settee made of knotted trunks of buckeye, limbs of a species of California rock maple and redwood, which are strong, rustic, graceful and quite a feature in the exhibition.

Strahle & Hughes present a billiard table made in California of a variety of beautiful woods, exhibiting excellent mechanical workmanship and having the Phelan cushions.

J. Derby has a set of school furniture which has the valuable qualities of being simple, easy for the scholars and affording the least possible occasion for noise.

Hasselgren & Wilson exhibit a spring bed of strong and durable workmanship and a variety of Eureka-hair mattresses. In connection with these mattresses, the Eureka Hair Company, through their agents, Hasselgren & Wilson, have on exhibition, in bales and sacks, some specimens of this material, made of the fibres of the plant commonly known as soap root—a part of it dyed black in imitation of hair and a part of it of the natural color, a dark brown. The Committee find the latter tougher, more elastic and not so harsh as the dyed; and in their judgment it is superior to all the cheaper materials for mattresses, when the particulars of health, cleanliness, durability, cheapness and freedom from vermin are taken into the account, and is only inferior to good curled hair.

B. Essig has an improved bedstead fastening, which for simplicity, strength and durability commends itself for general adoption.

N. P. Cole & Co., of San Francisco, have a solid California made rosewood parlor set, the wood of which came from Cape St. Lucas and was in the block one month ago; a solid oiled walnut parlor set; a marble-topped chamber set of oiled and polished black walnut, in rich contrast, the whole of exquisite design, taste and finish; a beautiful rosewood etegere, and two neat California made chairs with bottoms of rush covered with straw.

Goodwin & Co., of San Francisco, exhibit a rich black walnut chamber set with carved heads, an elaborate rosewood chamber set, a rich rosewood etegere, an exquisite Turkish chair, a reclining, self-supporting sick chair—which almost makes a weary Committee man sick for longing to get into it—a rich and graceful black walnut parlor set, and another black walnut parlor set finished in oil and ornamented with Mexican buffwood—antique, rich, unique.

The Committee are of the opinion that the premiums offered by the society should be awarded as follows:

To Goodwin & Co., for best bureau.
To Goodwin & Co , for best set of parlor chairs.
To Goodwin & Co., for best set of parlor furniture.
To Goodwin & Co., for best display of furniture.
To Goodwin & Co., for best sick chair.
To Hasselgren & Wilson, for best display of mattresses.
To J. Derby, for best set of school furniture.

They would also recommend that special premiums be given to the following persons:

To Semas Tonner, for rustic furniture.
To N. P. Cole & Co., for best etegere.
To N. P. Cole & Co., for cabinet work of California rosewood parlor set.
To N. P. Cole & Co., for best chamber set.
To B. Essig, for improved bedstead fastening.
To Goodwin & Co., for Turkish chair.

I. E. DWINELL,
H. W. HASSELGREN,
J. R. WHEAT,
WILLIAM SMITH,
Committee.

CHEMICALS, ETC.

SACRAMENTO, September 17th, 1867.

To the Board of Managers of the State Agricultural Society:

GENTLEMEN: The Committee appointed to examine Class 11 of the articles exhibited at the State Fair, September, eighteen hundred and sixty-seven, beg leave to report:

No. 8—That the yeast powder prepared and exhibited by Donnelly & Co., of San Francisco, is the only article of the kind put up in this State,

and is a very superior article and cannot be too highly recommended; and being apparently very carefully prepared and neatly put up, is, in their opinion, worthy of special premium. The exhibit of saleratus and bicarbonate of soda, being the best display of alkalies, is entitled to the premium.

No. 26.—Of cream of tartar, there are two entries, apparently alike in quality. Both are put up in convenient packages for sale; but in neatness of style and appearance the Committee give the preference to that of Justin Gates & Bro., and therefore recommend a special premium to them for the best display of cream of tartar.

No. 9.—The blue vitriol exhibited by Crane & Brigham, of San Francisco—and who are largely engaged in its manufacture—is highly commended, being equal in appearance to the best Eastern, an article heretofore largely among our imports. Your Committee are pleased to welcome its production as another effort to render our State independent by manufacturing, from crude material so abundantly within our reach, such things as are absolutely essential to our prosperity. Your Committee recommend it, therefore, as well worthy special premium.

No. 82.—Henry Lake exhibits a sample of Japan paste blacking, for boots and shoes—a California manufacture—which seems to possess superior qualities, and is entitled to premium.

No. 33.—A water-proof leather preservative, by Jacob Herkimer, intended for harness, wagon covers, boots, etc., claimed to be perfectly water-proof, elastic, a preservative of the leather, and to retain a beautiful black polish—which qualities your Committee, from observation, judge it to possess. Recommended for special premium.

No. 8.—A small machine, exhibited by the inventor, intended for marking cut papers for folding—an article of great convenience to druggists and others requiring such papers, saving much time and by uniformity in size and shape adding greatly to the neatness and beauty of a package. Recommended for honorable mention.

No. 39.—Justin Gates & Bro. exhibit one case of chemicals, one case perfumery and one case of fancy toilet goods, making a very creditable display. Recommended for special premium.

J. F. Fugazi, of San Francisco, exhibits hair dye, hair tonic, pomades, etc., of his own make, for which special premium is recommended.

No. 40.—Weidemann & Wengenroth's Chrystals de Paris are an elegant preparation. Recommended for special premium.

No. 47.—Samples of whale and sperm oil by C. H. Harrison, of the Phœnix Oil Works, San Francisco. The bleached oils are of very fine quality, and are recommended for special premium.

No. 84.—H. C. Megerle exhibits an article of his own preparation, called Henry's Effervescing Citrate of Magnesia Powders. Much study has been devoted to, and many efforts made, looking to the preparation in dry or granular form of a soluble citrate of magnesia, and much difficulty has been encountered in so doing. In this article most of those difficulties seem to have been overcome. Though not instantaneously soluble, the magnesia is held well suspended and gradually passes to perfect solution, apparently possessing the properties of a solution of citrate of magnesia. We recommend a special premium.

No. 123.—The California pitch presented by J. J. Hucks seems to possess very superior qualities. Recommended for special premium.

No. 128.—Hucks & Lambert's axle grease. This article is in such extensive use and so well known that it is unnecessary for your Com-

mittee to say anything on the subject. Recommended for special premium.

No. 132.—Are samples of raw and boiled linseed oil and oil cake, and California paint ground in oil, from the Pacific Oil and Lead Works, San Francisco. These oils, in the opinion of your Committee, have never been excelled. The raw oil is a pure article, and the boiled oil superior to any of the English or Eastern oils. The California paint is well ground and of good body. Special premiums are recommended.

No. 145.—Is another domestic manufacture and evidently a superior article, highly praised by those who have used it, to whom your Committee referred. The chemical, olive and yellow family soaps possess all the qualities requisite to a good soap, and the German erasive soap, as a detersive, is all that can be desired. We recommend a premium to R. H. Withington, of San Francisco, the manufacturer of the above soaps.

No. 152.—Ellery's patent India rubber paint and cement, from our limited means of observation, impressed us favorably. Recommended for special premium.

No. 6.—Are candles of California manufacture, exhibited by Adams, McNeill & Co. They are much superior in some respects to the Eastern made candles, exhibited by the same firm, and are recommended for premium.

No. 167.—The sample of white glue exhibited by W. M. Kimber may possess some qualities of which your Committee are unaware, but it is not what they would accept as a fair sample of the class, and in the absence of all explanation as to its peculiar merits do not recommend it.

J. F. RUDOLPH (Chairman),
H. C. KIRK,
C. H. KREBS,
Committee.

GLASSWARE, ETC.

SACRAMENTO, September 17th, 1867.

To the Directors of the State Fair of California for 1867:

GENTLEMEN: We, the Committee appointed as judges to make awards on articles designated under Class 12, Section 44, in the Third Department of the State Fair, hereby respectfully present this, our report:

We have made trials of the cement entered by P. Caduc, President Benicia Cement Company, for premium, and find that it sets readily under water, and also as a mortar to unite bricks. The quality of the cement we believe to be without a superior in any imported into this State. It has been adopted by the supervising engineer as the cement to be used in the construction of the seawall or bulkhead now being built at San Francisco, and has been used in the construction of many important buildings along the water front of that city. The company, we are informed, will manufacture about six thousand barrels of cement this year, and in view of its importance as a useful branch of domestic manufactures we recommend that a special premium (diploma) be

awarded the Benicia Cement Company instead of the money premium offered in the official published list.

We have made a careful and thorough examination of the large and varied assortment of glassware (both flint and colored) made and exhibited by Messrs. Newman & Brannan, of the San Francisco Glass Works, of that city. In our opinion, for quality of glass and workmanship, it will do credit to any city in the Union. We find it to contain specimens of the best ground glass, flint glass, bottle glass, bottles of green glass, vials of green glass, retorts and receivers (tubulated and plain), carboys and best display of glassware of any kind on exhibition. In view of the great risk and expense attending its successful introduction and manufacture, its large commercial value to the State and the Pacific coast, we recommend the State Agricultural Society, in lieu of the published premiums, to award either the gold medal belonging to the Third Department or a special gold medal, for exhibit of glassware of Newman & Brannan.

We also recommend a special award (diploma) to C. Newman, for his patent self-sealing fruit jars, exhibited by himself at the Fair.

Among the many useful inventions exhibited at the Fair, your Committee know of none more valuable than the patent glass melting pot invented by C. Newman. From the testimony of practical, earnest men who have witnessed its use, we feel assured its great merits will soon recommend it to general use, as it can be used either as an open or covered pot, making colored or flint glass, as may be required, in the same furnace. From its peculiar arrangement, it also melts glass in from twelve to fifteen hours shorter time than the ordinary covered pot does, and from the intense heat generated by the introduction of fresh oxygen at a certain point, admits of the making of good glass with salt cake (the refuse of acid works) and dispenses with the use of soda ash. We recommend for this invention a special award (diploma) for its great merits and its being a California production.

H. D. DUNN,
B. DENNERY,
Committee.

HOPS.

To the President and Directors of the State Agricultural Society:

GENTLEMEN: The hop interest is represented this year by sample bales from five yards and bearing vines from two—an exhibition which reflects great credit on the several growers.

We, the Committee, award the first premium to Messrs. Neal & Clark, Sacramento County, for the best sample of baled hops, and we recommend that honorable mention be awarded to Mr. William M. Haynie for the very perfect manner in which his hops have been cured—each flower, according to his patent process, remains intact. We have much gratification in testifying to the care taken in the picking and curing of the first premium hops. The flavor is delicate and particularly adapted for the brewing of fine ales.

Some of the crops have been gathered too green and are consequently unfit for shipping abroad, as they will not keep. This is a point that the hop grower should pay particular attention to, as he will soon have

to look for foreign markets to relieve him of his surplus stock, and it wil not pay to ship an inferior article.

Clean picking should be insisted on. We would only suggest the great necessity of proper drainage, as the farmer must be aware of the advantage accruing therefrom. Many of the hop yards are young yet, and it would be unreasonable to expect perfection in one or two years. The growth of this young interest in our State is marvellous, and those who have given their time to the cultivation of this plant have been well remunerated.

The ale, porter and beer business in this State is assuming large proportions, and it will amply repay the hop grower to second the brewer as best he can and make him independent of any other State or country for his supply of that bitter property which preserves ale, as well as renders it more palatable. We believe the day is close at hand when California will cease to import foreign ales and porter and when she will be in a position to export those articles with profit and credit to herself.

Messrs. Haynie and Smith & Merkley exhibit some fine specimens of hop-bearing vines, which perfume as well as beautify their department.

The patent hop kiln, invented by Mr. William M. Haynie, is on exhibition, and well worthy the attention of every hop raiser. By this process labor and time are saved, the full strength is retained and the flowers are not broken. We recommend that a first class special premium be awarded for this invention.

All of which is respectfully submitted.

AMOS ADAMS,
HUGH MOORE,
G. F. RICH,
D. L. PERKINS.

WINES.

SACRAMENTO, September 18th, 1867.

To the President and Board of Directors of the State Agricultural Society:

GENTLEMEN: The undersigned Committee of Judges to make awards in wines, sugars, syrup and brandy, exhibited at the State Fair, herewith tender their report, as follows:

WHITE STILL WINES, TWO YEARS OLD.

Those exhibited by Matthew Keller and Isabor Landsberger, both of San Francisco, were not only the best but of such equal merit that the Committee recommend both for special premiums.

C. Detten, Stockton, for best still white wine, one year old, is awarded first premium, $10.

RED WINES.

Isador Landsberger, San Francisco, for best red wine, two years old, is awarded first premium, $10.

Isador Landsberger, San Francisco, for best red wine, one year old, is awarded first premium, $10.

SPARKLING WINES.

Isador Landsberger, San Francisco, for best sparkling wine, is awarded first premium, $10.

A. Eberhard, San Francisco, for excellent sparkling wine, is recommended a special premium (diploma).

PORT WINE.

C. Detten, Stockton, for best port wine, is awarded first premium, $10.

West Bros., Stockton, for excellent port wine, one year old, we recommend a special premium (diploma).

CLARET WINE.

B. N. Bugbey, Folsom, for best claret wine (made from foreign grapes), is awarded first premium, $10.

SHERRY WINE.

Thomas Pettinelli, for best sherry wine, is awarded first premium, $10.

BEST EXHIBIT OF WINES MADE FROM FOREIGN GRAPES.

B. N. Bugbey, Folsom, for best exhibit of wines made from foreign grapes, is awarded first premium, $10.

BEST EXHIBIT OF WINES FROM NATIVE GRAPES.

Isador Landsberger, San Francisco, for best exhibit of wines made from native grapes, is awarded first premium, $10.

BRANDY.

C F. Scholl, Marysville, for brandy made from grapes, three years old, is awarded first premium, $10.

B. N. Bugbey, Folsom, for brandy made from grapes, two years old, is awarded first premium, $10.

Wm. Mace, Sacramento, for brandy made from grapes, one year old, is awarded first premium, $10.

MISCELLANEOUS.

We recommend the following exhibits, which are not named as entitled to awards in the premium list, to the consideration of the society, they all being very meritorious and the best of their kind in the Fair, viz:

B. N. Bugbey, Folsom, for wines made from the Catalyac, Johannisberger, Reisling and Orleans grapes, each being remarkably excellent.

A. Eberhard, San Francisco, for peach brandy made in eighteen hundred and sixty.

Matthew Keller, San Francisco, for California Wine Bitters, a most excellent article and worthy of especial mention.

F. P. Cassin, San Francisco, for best Grape Brandy Bitters.

L. Lacour, San Francisco, for Sarsapariphere Bitters, an article we recommend for medicinal bitters or tonic.

C. F. Scholl, Marysville, for best Angelica wine on exhibition.

Marks & Co., San Francisco, for best draught ale; to the same parties for the best bottled porter, the latter comparing favorably with the best porter imported.

P. Arnold, Collinsville, Solano County, for white wine of eighteen hundred and sixty-six, we recommend favorable mention.

The Committee would state that they have in several cases rejected wines of certain vintages on account of imperfect condition. They considered it was not the intention of the Society to award premiums to sour or adulterated wines, which would only perpetuate a practice of deceiving the public. They regret to state that the exhibit in the class they were appointed to judge was most meagre and insufficient, for the magnitude of the interests they represented. In wines, in particular, the exhibit was most disgraceful to the wine growers of the State, there being only twelve entries altogether, a portion of which were imperfect from lack of careful treatment, and adulterations to conceal the same. The Committee found evidences of wines that had spoiled, being "doctored" with brandy or pure spirits to conceal the acid, smell and taste. In sparkling wines they found that the same fraud had been perpetrated, the sour wine having had brandy and sugar syrup added to conceal the acid taste. It is by such practices the wine grower is injured, the entire interest being damaged by the cupidity of a comparatively few persons to pass off spoiled wines as perfect.

In conclusion, your Committee would suggest to the society to extend the range of their premiums to more classes of wines than has been the case this year. The Committee found quite a number of wines of great merit which could not be classed under the head of any for which premiums were offered. This was the case with wines made from foreign grapes by B. N. Bugbey, of Folsom, who entered a number of varieties of wines which were of excellent quality and suited to the taste of our French and German citizens.

HORACE D. DUNN,
H. W. HARKNESS,
B. B. REDDING,
JOS. M. GRAY, M. D.

MUSICAL INSTRUMENTS.

To the President and Directors of State Agricultural Society:

GENTLEMEN: We, the undersigned Committee, recommend the following instruments, displayed by Messrs. Kohler, Chase & Co., of San Francisco, and L. K. Hammer, of Sacramento (No. 16), for first premiums, viz:

One grand Chickering piano.
One square Chickering piano.
One Mason & Hamlin organ.
One Mason & Hamlin melodeon.
One set brass instruments.
One set clarionets.
One violin.

We would also call attention to the beautiful instrument called a "cithara," and the new invention, the "music leaf turner," exhibited by the same parties.

We also recommend a first premium to R. C. Marsh, of Sacramento, for three homemade guitars (No. 18), which are of a superior tone and workmanship.

And lastly, a first class premium to J. G. Dawes, of San Francisco, for a flute and a piccolo made by himself. It affords us great pleasure to state that they are both very fine instruments.

Your Committee desire to call particular attention to the Chickering pianos and Mason & Hamlin organs and melodeons. We are no less pleased than surprised at the rapid advance made toward perfection in these instruments. In our opinion the two houses are justly quoted as standing at the head in the manufacture of their respective instruments.

CHARLES WINTER,
HENRY MILLER,
WILLIAM. H. HILL,
Committee.

GOLD MEDALS.

The Board of Agriculture, in arranging the premium list for eighteen hundred and sixty-seven, divided the same into six general departments, as follows:

First Department.....Live stock.
Second Department.....Machinery, implements, etc.
Third Department.....Mechanical and domestic products.
Fourth Department.....Agricultural products.
Fifth Department.....Horticultural products.
Sixth Department.....Fine arts, etc.

With a view to stimulate exhibitors to greater exertion they offered, in addition to the regular premiums, the Society's gold medal for the most meritorious exhibition in each department. The Committee appointed by the Board to award these medals consisted of the following gentlemen:

Leland Stanford.....Sacramento.
B. B. Redding.....Sacramento.
J. F. Houghton.....Sacramento.
J. G. McCullough.....Sacramento.
General John Bidwell.....Chico.
George K. Gluyas.....San Francisco.
Horace D. Dunn.....San Francisco.
W. B. Ewer.....San Francisco.

The Committee met during the Fair and, being furnished a list of articles entered for competition for the medals, examined them. Instead of awarding the medals at the time, they requested the Secretary of the Society to notify all contestants that they would be required to furnish the Committee a statement of the particular merits of their claims; and in doing so, that each claimant might go into a complete history of his business in connection with the exhibition for which he claimed the medal. This was done for the purpose of placing in the hands of the Committee the basis upon which to decide the comparative merit of each exhibition in a particular department.

The following are the statements of claimants for the gold medals, as submitted to the Committee:

FIRST DEPARTMENT—LIVE STOCK.

STATEMENT OF THOMAS COTTER.

ELK GROVE, SACRAMENTO COUNTY,
October 10th, 1867.

To the Committee to award the Gold Medals of the State Agricultural Society:

GENTLEMEN: I send you a statement in regard to my sheep and my manner of breeding and caring for them. My Spanish Merinos are from different families or flocks in Vermont. I have some from Gleason's, Proctor's, Hammond's, and some from Rich's flocks. The breeding of sheep, so as to make up a good flock in every sense of the word, is a very important undertaking and requires much skill and judgment, and very few persons in this State take the pains they should to accomplish so important an object. At the commencement of the breeding season I keep my rams by themselves, but have one I call a teaser; upon him I put an apron and turn him in with my ewes. When he finds one in season, I determine, by an observation of her peculiarities, which one of my rams I will breed her to. I breed my longest legged ewe to my shortest legged ram, and the short woolled ewes I breed to the longest woolled rams, and so breed by crossing the opposites as far as practicable. In this way my lambs are very even. My flock consists of about seven hundred sheep—four hundred ewes and three hundred lambs. Many sheep raisers in this State have their lambs come too late in the season. The best time in this part of the State is from the first of January to the first of March. If the lambs come later than this period, before they are old enough to feed well the grass becomes dry and the lambs are checked in growth. This is a great injury, from which they never fully recover. All my coarse woolled ewes that I discover do not breed after the ram I dispose of for mutton. When my ewes begin to drop their lambs, I separate all those that have lambs and keep them in a small lot, where there is good feed, by themselves. If one ewe has twins and another one loses her lamb, I take the skin off the dead lamb and fasten it on one of the twin lambs and tie his legs and lay him where the dead lamb was found, in as nearly the same position as I can. When the mother of the lost lamb finds him and sees that he can't get up and that he seems, by smell and appearance, to be her own lamb, her sympathy is so excited that she does not notice the difference. When she appears to have become considerably attached to him and seems to want him to follow her I untie him; and by keeping her and this lamb together, and separate from the balance of my sheep, a few days, I fully and practically establish the relation of lamb and dam. So I lose but few lambs, and make all my ewes help to raise and nurse my lambs. I have but little pretentions to the gold medal for the stock department, but as between sheep, cattle, horses and hogs, I think sheep should get the medal, as I think sheep are of the most importance to the interests of the State.

THOMAS COTTER.

STATEMENT OF SENECA DANIELS, OF SONOMA COUNTY.

LAKEVILLE, October 14th, 1867.

To the Committee to award the Gold Medals of the State Agricultural Society:

GENTLEMEN: I understand that we have to state some reasons why we wish the gold medal awarded by the State Society, etc.:

First—The Devon cattle are the best for this country, for they are very hardy. The Winters here are very severe on cattle, as they are usually kept, and the Devons will thrive where others will hardly live. When I started to cross the Plains I had about equal numbers of Devons and Durhams. Those of my Durhams that did not die on the journey died in the flood of eighteen hundred and sixty-one and eighteen hundred and sixty-two. I had two of them left, while I lost very few of the Devons.

Second—There is no better cattle for beef. The beef is of a very fine quality, and they are easily fattened. Some claim that they are too small. It is because they do not know what they are talking about. If they are small, I can fatten two with as little grain as they can one Durham. Durhams will do in such a climate as they have in Kentucky, but they will not do here until farmers can have barns to shelter them and take better care of them.

For working cattle there are no better in the world. The Devon oxen of New England are always considered the best there is.

For milkers they cannot be excelled; there is no better quality of milk. I never weighed one of my Devons until after the State Fair. A two-year-old bull weighed one thousand four hundred and twenty pounds; an aged bull weighed one thousand six hundred and forty pounds.

If the society should be pleased to award a medal to my cattle, if it could be awarded to Daniels & Rose, I should like it, as we own some of them together.

Respectfully yours,

S. DANIELS.

STATEMENT OF J. D. PATTERSON, OF ALAMEDA.

BROOKLYN, Alameda County, October 28th, 1867.

To the Committee selected to award the Gold Medal offered by the California State Agricultural Society for stock exhibited at their Fair for the year 1867:

GENTLEMEN: The undersigned would respectfully submit his claim in competition with others for said award, having had on exhibition at said Fair six pens of French and Spanish Merino sheep, all bred in California from the stock I have at different times imported from Europe and the Atlantic States. As to the merits of the animals I had on exhibition, I will only say that all of them were strictly thoroughbred sheep, and would call your attention to the fact that they were awarded one sweepstakes and six first premiums. Should it come within your province to

inquire into the relative merits of the different classes of stock in the State, to ascertain as to their producing qualities at the present time, and what future bearing they may have upon the prosperity of the State by exportation and for home consumption, you are, as I understand it, to designate the class of animals which, in your opinion, produces the largest profits to the breeders of them, as well as to the State at large.

Without wishing any disparagement to the other varieties of stock in the State, I would call your attention to the great and increasing interest now being taken in sheep, it being the general opinion of those who are well informed on the subject that they will produce more meat for the amount and value of food they consume than any other class of animals; in addition to which, they yield a large annual profit in their wool.

You are well aware that a large portion of this State is too mountainous to be suitable for grain growing purposes; that the feed upon such lands is short, dry, and in many places difficult to obtain; and where the hillsides are so steep and broken that horses and cattle never attempt to graze, unless starvation compels them to go there, they yet make excellent ranges for sheep. And although in such locations there cannot be as many kept to the acre as can be in the rich valleys, where food is of a larger growth, there is no other kind of range where sheep do better, or where, if left to their own will, they are more inclined to go. Hence, while much of our mountain land is almost entirely unproductive for any other agricultural purpose, such land can be made available and profitable when stocked with sheep; and for this reason wool growing will eventually become one of the most productive and important interests of the State.

It is estimated that there are at the present time in California about two and one half millions of sheep, producing the present year about twelve million five hundred thousand pounds of wool, some three million pounds of which will be required to supply the woollen mills on this coast, leaving the balance for exportation.

My own flock of Spanish Merino sheep was established by myself in eighteen hundred and forty-two, they being the descendants of the early importations of sheep from Spain made by Consul Jarvis, Chancellor Livingston and Colonel Humphreys, and since that time no expense or pains have been spared to bring them up to the highest standard of excellence.

For the purpose of improving my flock by keeping up a judicious system of crossing, I have not only purchased at many different times breeding animals from the most celebrated and reliable breeders of sheep in the Atlantic States, but have also imported largely from the best flocks in Europe, and for the purpose of obtaining the choicest animals have paid in Europe higher prices for Merino sheep than any other American breeder.

The first pure Merino sheep introduced into this State were purchased of me (at my farm in Chautauqua County, New York) by Messrs. Searle & Wynn, of San Francisco. Previous to that time, there had been importations of fine wool sheep from Australia, which were called Merinos, but they were of the Saxon variety, were not so large, so hardy, nor did they yield so heavy fleeces as do the sheep known as French and Spanish merinos, though their wool is of a finer quality.

In eighteen hundred and fifty-seven Samuel Brannan, Esq., of San Francisco, made two different purchases of Merino sheep of me, they being selected from my flock in New York.

In eighteen hundred and fifty-eight Messrs. Searle & Wynn made a

second purchase of Merinos of me, and the same year I sold sheep to several other parties, who brought them to this State for the improvement of their flocks.

In eighteen hundred and fifty-nine I made my first importation of sheep to California on my own account, the value of which was over twenty-six thousand dollars.

In eighteen hundred and sixty I made two importations of sheep, embracing the French and Spanish Merinos, South Down, Leicestershire and Cotswold varieties, amounting to over forty thousand dollars, all of which were sold and scattered through different counties in this State.

Previous to visiting California, I had traveled extensively through every State east of the Rocky Mountains, from New Hampshire to Minnesota and Texas, for the purpose of finding the best location for establishing a flock of thoroughbred sheep, with the view of supplying the wool growers of the surrounding country their breeding animals. Not succeeding in finding a location that in all respects was what I wanted, and having heard much of the advantages possessed by California for wool growing purposes, I was induced to visit this State (in eighteen hundred and fifty-nine) and judge for myself whether or not the country was what it had been represented to be. And when here, in eighteen hundred and sixty, I became so fully satisfied, from what I saw and heard, that no other country I had ever seen possessed equal advantages for growing wool cheaply and extensively, that I purchased a ranch in Alameda County to enable me to carry out the object I had so long desired.

In eighteen hundred and sixty-one, I made other and much larger importations to stock the ranch I had purchased, and these sheep, with their increase, embraces my present flock, now numbering over fifteen hundred head of strictly thoroughbred Merinos, a much larger number than are owned by any other individual breeder in America, and more pure Merinos than are now owned by all other persons on the Pacific coast; for, wishing to increase my flock as rapidly as possible, I have refused to sell a Merino ewe since that date, but sell my rams yearly.

Nearly every year since eighteen hundred and sixty-one, I have imported valuable rams to be used wholly in my own flock, thereby infusing into it different strains of blood from the best flocks now in the Atlantic States and avoiding the necessity of too close breeding. In a brief manner I will give my mode of breeding my Merinos. In the first place, I would state that every sheep in that flock has a metallic number attached to the ear (like the one inclosed), the letter on the number indicating the age, or year when born. We never allow the rams to run promiscuously with the ewes at any season of the year. At the coupling season, the rams are always put from the hand to each ewe when in heat, as is usually done with a horse. A register is kept in which each ewe is recorded (by her number) when served, showing the date of service and the name of the ram by which she was served. When her lamb is born, it is also numbered and registered, the date of its birth, the name of its sire and the number of its dam being given, so that we can give the lineage or pedigree of each individual sheep in the flock for generations back. This register (which is similar to the leaf inclosed) shows the number of each ewe, her age, weight of fleece for different years, date when coupled and by what ram, the numbers of her lambs, the different years, with the names of their sires, the number of dam, and all their different qualities are recorded in it. This enables us to know all the general characteristics of each individual sheep in the flock; and

when coupling them we select such rams to breed to the different ewes as will, in our opinion, produce the best results, or make the best crops, not allowing them to breed too closely akin, but avoiding what is known as "in and in breeding." We also, in breeding, intend to correct as much as possible any defect or weak points on the part of the ewe, always selecting to couple with her such a ram as is strong in those points or has them the most fully developed. By continuing this system of breeding, a flock can be changed and improved much more rapidly than it would be possible to do it in any other way, for by referring to our register we can see at a glance the defective or desirable points of every sheep recorded in it, and are thereby enabled to judge of the improvements we are making from generation to generation. Many think that this system of breeding is difficult and requires more care and labor than common wool growers can afford to devote or will give to their flocks. This view is undoubtedly correct. We do not ourselves adopt it in our flock of common sheep.

But our flock of thoroughbreds have cost a very large amount of money, and we are striving to improve them as rapidly as possible, believing the time will soon come when such sheep will be more fully appreciated here than they ever have been, and that such as we have to spare will be wanted by the wool growers on this coast at remunerative prices; besides, as we are raising these sheep for breeding purposes, having no doubt but wool growing will soon become one of the greatests interests of the State, it being only the third in importance at the present time (not including its mineral productions), we wish to be able to give to each purchaser of our sheep the correct pedigree of such as we sell. Several of the sheep imported to this State by myself were prize animals in Europe, one of them being the ram to which was awarded the great prize of four hundred and fifty francs at the World's Exhibition at Paris in eighteen hundred and fifty-five; and it perhaps would not be too much to assert that the distribution of these sheep among the various flocks of the State has added (present and prospective) millions of dollars to the wealth of California. My importations of sheep from France have been from the Government flock at Rambouillet and the individual flocks of Messieurs Gilbert, Cugnot, Lefevre and others, all of whose flocks have originated from selections made from the Government flock, which was established in the days of Louis XVI.

[On pages one hundred and eighty two and one hundred and eighty-three is given a copy of a leaf from the "Sheep Register" of J. D. Patterson.]

BREEDING EWES.

Numbers on flock....	Age, or when born...	WEIGHT OF FLEECE.					Date when coupled...	NUMBERS ON HER LAMBS.					PEDIGREE.				Quality of wool.....	Length of staple.....	Thickness of fleece...	Yolkiness	Covering of belly....	Covering of head.....	Wrinkleness.....	Constitution .....
		1865.	1866.	1867.	1868.	1869.		1865.	1866.	1867.	1868.	1869.	Sire.	Dam.	Size.	Form.								
201	A or 1863	13	14½	13½	.....	.....	Sept. 5	216	221	230	.....	.....	Don 15	9	1	1	1	2	1	1	2	3	5	1
202	1863	12	13½	14	.....	.....	Sept. 9	215	225	234	.....	.....	No. 17	78	2	1	2	1	1	3	1	2	3	1
203	B or 1864	11	12¼	12½	.....	.....	Oct. 20	.....	217	237	.....	.....	Vt. 20	91	1	2	1	1	2	2	2	1	2	1
204	C 1865	.....	15½	16	.....	.....	Sept. 23	.....	.....	238	.....	.....	G.T.23	147	2	1	2	1	1	1	1	2	1	1
705	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
206	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
207	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
208	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
209	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
210	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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212	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
213	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
214	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
215	C 1865	.....	17½	20	.....	.....	Ram.	.....	.....	.....	.....	.....	G.F.23	202	1	1	1	2	1	1	1	2	1	1
216	C 1865	.....	16	.....	.....	.....	Ram.	.....	.....	.....	.....	.....	Vt. 20	201	1	1	1	1	2	1	1	2	4	1
217	D 1866	.....	14	.....	.....	.....	Sept. 8	.....	.....	.....	.....	.....	Nug 22	203	1	1	2	1	1	1	2	1	3	2
218	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
219	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
220	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

221	D 1866	.....	.....	12½	.....	.....	.....	.....	.....	.....	.....	.....	Vt. 20	201	1	2	1	2	1	2	1	1	4	1
222	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
223	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
224	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
225	D 1866	.....	.....	15	.....	.....	Sept. 15	.....	.....	.....	.....	.....	G.G.23	202	2	1	2	1	2	2	1	2	1	1
226	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
227	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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229	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
230	E 1867	.....	.....	.....	.....	.....	Ram.	.....	.....	.....	.....	.....	S M 25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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233	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
234	E 1867	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Mor 17	202	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
235	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
236	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
237	E 1867	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
238	E 1867	.....	.....	.....	.....	.....	Ram.	.....	.....	.....	.....	.....	Vt. 20	204	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
239	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
240	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

REMARKS.

No. 201—From Humphrey's importation, by S. Atwood sheep.
No. 202—From Jarvis' importation direct, Good Nurse.
No. 203—From Hammond flock.
No. 204—From original flock.
No. 215—Sold to J. Davidson, Oregon, in 1867.
No. 216—Sold to G. Leithbridges, Australia, in 1866.
No. 217—Coupled with Gold Drop, No. 24, September 8th, 1867.
No. 221—Humphrey and Atwood blood.
No. 225—Coupled her with Gold Mine, No. 80, in 1867.
No. 230—Sold to Captain Wilcox, San Diego, in 1867.
No. 234—Killed by dog, June 17th, 1867.
No. 238—Sold to George Boker, Red Bluff, in 1867.

EXPLANATION.—Except in columns for numbers, age and weight of fleece, the figures imply relative degree of quality—1 is assumed as the maximum and 5 as the minimum degree of quality.

[In the book kept by Mr. Patterson "Remarks" occupy a column to the right hand of those given above.]

Entertaining the opinion that the market for mutton in California would be limited, and that the feeding of sheep valued chiefly for their meat, such as South Downs, Liecesters, Cotswolds, etc., could be overdone, but the whole world being open as a market for wool, wool growing would be a business that could not be overdone, so long as there was sufficient range for the sheep, for unlike most other kinds of agricultural productions it requires but a small percentage of its value to transport it to any foreign market, it was and still is my opinion that good wool-growing sheep, which are also good mutton sheep (though for that purpose alone not equal to the English breeds mentioned above), are best adapted to the wants of the wool growers of this coast, and have paid more particular attention to the breeding of the Merinoes, both French and Spanish.

I however imported and have brought to this State at different times some of the finest specimens of the English breeds of sheep before mentioned, my South Downs being selections from the flocks of the late Jonas Webb, Lord Walsingham, Mr. Elman and the Duke of Richmond, and my Liecesters and Cotswolds were purchased of English breeders of the highest reputation.

My sheep have been on exhibition at most of the State Fairs of California since and including the Fair of eighteen hundred and fifty-nine, and if you will refer to the records of the society you will find that my sheep and those imported and sold by me to others have always been awarded the highest prizes at all the Fairs where they have been exhibited.

I have taken some pains to ascertain the percentage of increase in the production of wool in this State for several years past, and from the most reliable statistics within my reach I find that the clip of wool in California in eighteen hundred and fifty-six was about six hundred thousand pounds; in eighteen hundred and fifty-seven, about one million one hundred thousand pounds; in eighteen hundred and fifty-eight, about one million four hundred and thirty thousand pounds; in eighteen hundred and fifty-nine, about two millions three hundred and eighty thousand pounds; in eighteen hundred and sixty, about three millions three hundred thousand pounds; in eighteen hundred and sixty-one, about four millions six hundred thousand pounds; in eighteen hundred and sixty-two, about six millions four hundred thousand pounds; in eighteen hundred and sixty-three, about seven millions six hundred thousand pounds; in eighteen hundred and sixty-four, about eight million pounds; in eighteen hundred and sixty-five, about eight millions, five hundred thousand pounds; and the improvement in the grade of wool caused by the introduction of the Merino sheep has been nearly equal to the increase in quantity.

No other section of this country was ever so successful in sheep husbandry; and yet it should be borne in mind that wool growing is but just in its infancy in this State, and also that there has been great mortality among sheep as well as other animals, during some of the years referred to.

JOHN D. PATTERSON.

SECOND DEPARTMENT—MACHINERY, IMPLEMENTS, ETC.

STATEMENT OF HOWLAND, ANGELL & KING.

San Francisco, September 24th, 1867.

To the Committee for the award of Gold Medal on Machinery:

Gentlemen: The claims of the Hicks steam engine as a machine presenting the greatest number of new, important and valuable features, adapted in a superior degree to the various purposes for which it is intended and to the extremely varied requirements of the State of California as well as the whole of the Pacific Coast, entitle it to the gold medal to be presented in the department of machinery by the State Agricultural Society.

Its advantages over other machines exhibited, taking into consideration the purpose for which it and they are intended, are:

First—Its economy in price.
Second—Its economy in space occupied to perform its duty.
Third—Its economy in foundations—the cylinders and frame forming one casting, making the whole perfectly rigid apart from its foundation.
Fourth—The economy in weight of material used.
Fifth—Superiority in the disposition of the least possible amount of metal, securing the greatest amount of useful effect.
Sixth—Economy in freight required for transportation.
Seventh—Matchless simplicity of construction.
Eighth—Comparative non-liability to become out of repair, which is due to the few parts of which it is composed.
Ninth—Impossibility of the derangement of the vital parts directing and controlling the transmission of steam.

Its advantages over other steam engines embody the whole of the above as well as:

Tenth—A wider and more general adaptation to the varied requirements of the State.
Eleventh—Having no dead centres, which has been well proved by its action in the Fair.
Twelfth—Greater convenience and simplicity in reversing.
Thirteenth—Dispensing with all valve gear and complex valve motions, which are always so liable to become out of repair, especially so in the interior of the State, where opportunities to repair are difficult to be obtained.
Fourteenth—Impossibility of the cylinders to become out of line.
Fifteenth—Requiring less skill in its attendance than any other engine, which on this coast, especially in the interior, is a most important feature.

HOWLAND, ANGELL & KING.

STATEMENT OF WILLIAM D. HOOKER.

San Francisco, October 15th, 1867.

To the Committee appointed by the State Agricultural Society to award Gold Medal:

Gentlemen: I have the pleasure to lay before your honorable body the specifications and their drawings of my improved balance valve for steam engines, and mode of operating the same.

The nature of my invention consists in dispensing with the slide valve usually employed in steam engines, together with all of the attachments and machinery known or used to operate such valves, and substituting in lieu thereof a simple, plain cylindrical valve, which is operated by the direct action of the steam in its exit from the engine cylinder without the aid of any other devices or arrangements being employed to operate the said valve, thus economizing the use of steam to a great extent, and also obtaining the full power or force of the supply steam in driving the work.

The valve is perfectly balanced in all its movements, is very durable and can be easily removed from its chamber, examined and replaced by simply taking off the valve chamber bonnet. You will also observe with what immense velocity the valve is driven when the moment arrives to reverse the main piston, and the ease with which the valve is balanced and brought to rest after it has completed its stroke, its motions being regulated with the greatest certainty and governed entirely by the motion of the main piston.

The manner of cushioning or arresting the main piston at the ends of the stroke is easily understood; as the piston passes or covers the ports at the ends of the main cylinder, the air confined between the piston and cylinder cover is made to shut the small valves inserted in the ends of the main cylinder, the compressed air acting as a spring and gives back to the piston the power imparted to it by compression the instant the valve changes and the direction of the piston is reversed.

The small valves inserted in the ends of the valve chamber, together with their connecting rod, work in unison with each other and with the main valve in such a manner that the steam, in the act of escaping and reversing the main valve, shall shut one of the small valves, and by means of the connecting rod hold the other open, the object being to allow the confined air at the opposite end of the main valve to escape and oppose no hindrance to the flight of the valve until it has passed or opened the opposite supply and exhaust port, when the escaping air is cut off and the valve is balanced by the pressure of the exhaust steam being equalized at both ends of the valve and the valve cushioned on compressed air. The travel of these small valves is very slight, one-sixteenth of an inch being sufficient for the largest engines.

The flight of the valve when in the act of supplying and exhausting the steam to and from the main cylinder is immeasurably great as compared with the velocity of the main piston, consequently the supply and exhaust ports are opened instantly and the load to be driven receives the full effect of the steam; the exhaust is also free to pass to the external air and moves the valve in its exit from the engine cylinder.

The recesses in the valve are made very small and are intended to be only of sufficient area to make a steam-tight joint between the valve and valve-seat.

The recesses in the main piston are similar to those in the valve and are intended to be of sufficient area to raise the piston and thereby prevent the bottom of the cylinder from wearing and also make a steam-tight joint where the piston covers the small ports in the main cylinder. The main valve and piston are provided with packing rings, in the usual manner.

By dispensing with the slide valve, usually used, I overcome the friction of the same and obtain a quicker action of the steam consequent to a quicker action of my valve, and the engine can be driven at an immense velocity. It will also work as slow as one stroke per minute, and make its strokes with unerring accuracy.

There are no dead points or centres that the valve will stick on; but as either one or the other of the supply ports are always open, the engine will always start when the supply steam is admitted to the valve chamber.

The simplicity of this engine will be apparent without any further explanation. The cost of manufacture is greatly reduced. The engine can be taken apart and put together much quicker than any engine yet known. It is certain in all of its movements, durable in all its parts, composed of fewer pieces than any other engine yet invented, easily managed by any person of ordinary intelligence. It is peculiarly adapted to steam fire engines. It completely supplants the Giffard Injector, both as to cheapness, greater range, capacity and certainty of movement as a boiler feeder; adapted also to driving rock drilling machines, steam hammers, and any position where a direct action is required.

This arrangement of engine is easily adapted to a rotary as well as a reciprocating movement, by adding the crank and fly-wheels, and can be reversed and run in opposite directions by simply reversing the valve by hand, as will easily be understood without further explanation.

It is a California invention, and first exhibited at the State Fair in Sacramento. It is an entirely new and novel valve arrangement; its patent has been allowed me. There were other machines exhibited at the State Fair of intrinsic merit; but all of them have been on exhibition before, either in this country or Europe, and medals and diplomas have been awarded them frequently.

All of which is respectfully submitted.

WILLIAM D. HOOKER.

STATEMENT OF THOMAS HANSBROW.

SACRAMENTO, October 29th, 1867.

To the Committee on Awarding the Gold Medal of the State Agricultural Society:

GENTLEMEN: As many of the exhibitors in the machinery department of the late Annual Fair of the State Agricultural Society have called your attention to the qualities which they claim for the machines entered for premium by them, I also respectfully ask your careful consideration of the merits of the following described machinery, invented and manufactured in California, which I exhibited there:

First—Hansbrow's Planet Pan—a new invention for saving gold.

This pan was invented to supply a want long experienced by miners and those interested in mining in this State; that is, a reliable and efficacious machine for saving gold and silver. To produce something of this kind, a large amount of capital has been invested in machinery, without bringing to light anything which has really commanded the confidence of miners. Mining statistics show that in California, within the last fourteen months, upwards of two hundred and thirty thousand dollars have been expended alone in experiments and improvements on grinding and amalgamating pans of the old patterns now in operation. I believe my Planet Pan to be the best machine in the State for saving gold and silver. Twenty-three of them are running in Nevada County, and are considered by those to whom they belong as far superior to any gold-saving pan now in use.

Second—The Hydrostatic Engine, a working model of which was on exhibition.

This engine has proved itself to be one of the most economical water powers in the world. Two of them have been built—one with a cylinder of seven inches and another with a cylinder of twelve inches. A seven-inch cylinder engine was exhibited by me at the Mechanics' Fair in San Francisco, to which a committee of scientific gentlemen, without hesitation, awarded the first premium over all other water power on exhibition.

Third—The Hansbrow Pump—the superiority of which over all other pumps is acknowledged by those who use it.

Seven different kinds of this pump are manufactured, viz: Mining pump, fire engine pump, windmill pump, ship's pump, deep well pump, house pump and direct-acting steam pump, all of which are secured by four patents. It is believed that more of these pumps are used in California and on the Pacific Coast than in all the other States combined. They continue to be in great favor and the demand for them seems to be constantly increasing.

The Hansbrow Pump exhibited by me, and which was placed in the upper hall, is the same to which was awarded, over three hundred and eight competitors, the grand prize medal of the London International Exhibition of eighteen hundred and sixty-two, not only upon its merits as a pump, but as being one of the most finely finished pieces of mechanism at that Fair.

I claim to have exhibited in the mechanical department the greatest number of articles of importance to the State shown by any one individual, consequently I believe myself entitled to the award of the gold medal.

The following is a list of the several articles I had on exhibition:

One hydrostatic engine (running).

One Planet amalgamating pan (running). The only piece of machinery relating to mining in complete running order.

Two fire engine pumps.

One mining pump (running).

One ship's pump (running).

One deep well pump (running).

Two hand pumps (running).

One World's Fair pump (entered as the best piece of mechanical work on this coast).

THOMAS HANSBROW.

STATEMENT OF REDSTONE BROTHERS.

To the Committee to award the Gold Medals of the State Agricultural Society:

GENTLEMEN: In our claims for the award of the gold medal by the Awarding Committee appointed at the late State Fair for the production of a generally useful and important machine, you will please bear in mind and do us the favor to bring the following statement before the said Committee:

First—We claim the production of an entirely new device.

Second—This device, with various fittings, can be used (and is preferable) whenever a crank movement is desired over a straight axle.

Third—That the changing of rotary into reciprocating and reciprocating into rotary motion is accomplished with less bearings, forming its own bearings on its center of motion.

Fourth—That it is used to greater advantage in a greater number of machines than anything on exhibition at the last State Fair. We wish further to call attention to our model steam engine, also worked by the same movement or device. The device economizes the entire length of the Pitman in the sawmill, engine, pumps, morticing machine, shingle cutter, and all other places where a straight line movement is to be had from the ordinary crank. We will be brief in this specification, and trust the rest to the mechanical ability and intelligent decisions of the Committee, trusting further that, as we have lately entered into competition with the inventive genius of this State, we will have a respectful examination and the awards we merit.

Yours, truly,

REDSTONE BROTHERS,
Dutch Flat, California.

STATEMENT OF THE PACIFIC SAW MANUFACTURING COMPANY.

SAN FRANCISCO, October 15th, 1867.

To the Committee on Gold Medals:

GENTLEMEN: I would state for your information that we put in a claim for one of the gold medals on these grounds: That we are now manufacturing circular, cross cut, and in fact all descriptions of saws that can be used in the manufacture of lumber; that we have entirely stopped the importation of saws, both from the Eastern States and from Europe; that we manufacture our saws from the raw material just the same as all other saw manufacturers do in the United States, for there is not one of them that make their own steel (though I understand that there is one shop in Philadelphia which is just about to commence doing so). We would also state that before commencing the manufacture ourselves we were the heaviest importers on this coast; that for the past eighteen months we have not imported any kind of a saw either from the Eastern States or from Europe. Also, that Messrs. Jacob Underhill & Co., of San

Francisco, were the agents for Messrs. Hoe & Co., of New York, for the sale of their saws here, and that they have shipped back to New York all the stock of saws they had on hand here, for the reason that we could sell a better saw at a less price than they could.

In conversation with some of the parties connected with the Fair, whilst in Sacramento, they seemed to have an impression on their minds that the sawmill business on this coast did not amount to much. In answer to that objection we refer you to "Langley's Pacific Coast Directory" for 1867; see pages 88 to 95 for California, and pages 123, 135, 139, 145, 149 and 153; also that we ship saws to the British possessions. To nearly all of these mills we have sent circular and other saws, from time to time, and there is no doubt but that we shall continue to fill their orders with our own manufacture for the future.

All of which is respectfully submitted for your consideration.

Yours, respectfully,

THOMAS LIVESEY,
For the Pacific Saw Manufacturing Company.

STATEMENT OF BAKER & HAMILTON.

SACRAMENTO, October 16th, 1867.

To the Committee to award the Gold Medals of the State Agricultural Society:

GENTLEMEN: A gold medal being offered by the society at the recent State Fair to the exhibitor of the most meritorious display in each department, and we being one of the exhibitors, the following are the articles shown by us, and the reasons why we should be awarded the gold medal in the Second Department. The variety of articles exhibited by us renders it imperative that we should be brief in noting the use and usefulness of each:

First—A Wood & Mann's portable steam engine, six by twelve inch cylinder, driving a Pitts improved threshing machine having a forty-inch cylinder and a forty-six-inch separating capacity. This engine has the newly invented water bottom, which entirely surrounds the fire-grate and ash-pit—forming underneath the ash-pit, as well as up the sides of the furnace, a three or four inch water space, by which additional heating surface is obtained, the accumulation of sediment around the fire-box or furnace is entirely prevented, and renders it perfectly safe to use near any barn or in any grain field, or in any building where a stove would be allowed, as no sparks can possibly escape from the furnace or ash-pit. The sediment has a free passage to the bottom of the fire-box and can be blown off daily by the blow-off cock underneath the the ash-pit, by which the boiler may be kept clean much longer than under the old system. This engine is particularly adapted to all the requirements of the farmer.

The threshing machine is of very early origin. Before threshing machines were invented the threshing floor was used. It was a flat surface of ground, covered with clay, rolled smooth and hard. The grain, in

bundles or sheaves, was spread on this floor, and cattle driven over it until the grain was beaten out by constant trampling upon. The Egyptians usually muzzled the ox while threshing, and the Greeks, it is said, besmeared the mouths of the animals to prevent their eating the grain. In Chile at the present time the threshing floor is still used, but instead of the ox a large number of horses are used. The flail is also in common use in all countries by small farmers, and is supposed to be the first mechanical device for threshing.

The first machine for threshing was merely an adaptation of suitable mechanism to drive a large number of flails by water power. Though unsuccessful in practice, this machine attracted considerable attention. It was the invention of Michael Menzes, of Scotland. In seventeen hundred and fifty-eight a Mr. Leckie, of Sterlingshire, invented a rotary machine, which consisted of a horizontal shaft with a set of cross-arms attached, and the whole inclosed in a cylindrical case. It proved tolerably efficient for threshing oats, but was not adapted to wheat, as it knocked off the entire head without separating the kernels.

The superiority of a rotary motion having been demonstrated, it was comparatively easy to remedy some of the defects and perfect the invention.

In seventeen hundred and eighty-six, Andrew Meckle, of Scotland, made an improvement in Leckie's machine by substituting a drum or cylinder with projections on its surface by sticking in short pins. This is the origin of the threshing cylinder in present use. A patent was procured in Great Britain by Mr. Meckle in seventeen hundred and eighty-eight, in which year he constructed his first working machine. He afterwards improved it by raising the cylinder on the second floor, and by means of open grates for the grain and chaff to drop through. He connected underneath a fanning mill, by which means the grain was separated and cleaned from the chaff. From this beginning Americans have perfected the machine to its present state, so that the wheat is now as it comes from the thresher fit for either the miller or for sowing as seed, being freed from all fine or foreign seeds. The most prominent American inventors connected with the threshing machine were twin brothers, John A. and Hiram Pitts, natives of Maine. The principles of separating the straw from the grain and combining the threshing cylinder and fanning mill therewith was their invention, and is the only practicable portable thresher and cleaner now in use in the United States. This machine is used in Chile, South America and Australia. From a very small beginning the manufacture of threshing machines has grown to be a very important branch of business.

The capacity of the Pitts thresher on exhibition is three thousand bushels of grain per day. The immense quantity threshed and perfectly cleaned make these machines economical for the farmer's use, putting his grain in market cheaper than by any other process.

We also had on exhibition, as worthy of special attention as labor-saving machines, two Buckeye mowers, Nos. 1 and 2, one Buckeye combined reaper and mower, one Russell's mower, one Union mower. These machines are each adapted to a peculiar kind of cutting, and as a whole are calculated to cut any kind of grass or grain perfectly—mowing with one man and one span of horses ten acres per day, and reaping from ten to fifteen acres, laying it in compact bundles for binding, with two men and one span of horses.

The wheeled wire horse-rake on exhibition was a recent invention. The driver rides and drives one horse; a brake applied to the wheels by

the driver's feet unloads the rake. This can be worked by a boy ten years old, and will rake twenty acres per day.

The eleven-tooth cultivator is a California invention, and called "California Cultivator." The standards are eighteen inches long and have steel moulds "reversible;" it is used principally for "volunteering," rendering ploughing unnecessary, and is also used instead of Summer ploughing the second time, one man with six horses cultivating as much as ten men with ploughs.

The patent combined gang plough, seed sower and harrow on exhibition is a great advantage to the farmers. With this machine one man with a team of six horses can do the work of three twelve-inch ploughs, besides sowing the grain and harrowing it in as he proceeds, thus finishing his work in the best possible manner without being obliged to travel over the ploughed ground. This is a California invention, made very substantial; is not liable to get out of order, and as it is on large wheels, runs lighter than other gang ploughs, notwithstanding the addition of seed-sower and harrow. This plough being built East did not compete with those of California origin and make. We exhibited the same plough without the seed-sower and harrow attached; this plough has all the advantages of the former as a plough. Over three hundred of these ploughs are now used in different parts of the State, and the constantly increasing demand leads us to believe they are a valuable acquisition to the farmers.

The following articles being in so general use and so well understood by the Board, it is unnecessary for us to more than give the names:

One double-shovel plough.
One cast caststeel plough.
One prairie plough, cutting sixteen inches.
One improved Boston clipper steel plough, X 10, cutting eighteen inches, with wheel and coulter.
One steel plough, X 00, cuts seven inch wide.
One steel plough, X 0, cuts eight inch wide.
One steel plough, X 1½, cuts ten inch wide.
One steel plough, X 8½, cuts twelve inch wide.
One steel plough, X 6, cuts fourteen inch wide.
Four Peoria ploughs, made at Peoria, Illinois, Nos. 5½, 6 light, 6 and 7, cutting each twelve, thirteen, fourteen and fifteen inches wide.
One steel plough, for ploughing on sidehills, and one cast plough, for the same purpose.
One very large cast breaking plough, No. 78, for four or six horses, cutting eighteen inches wide, with steel share, double coulter and gauge wheel.
Two two-horse cast iron ploughs, numbers C three and C four.
Two cultivators, with "reversible" steel moulds with seven and nine teeth.
Twenty-two different kinds of mowing and reaping machine knives.
One case of Dittmar's pruning tools, made in Germany.
One rotary harrow.
One corn sheller.
Two thermometer churns, one capable of churning twenty-eight gallons, the other of two gallons capacity.
One self-sharpening hay cutter.
One circular saw mill, for sawing cordwood.

One broadcast seed sower, Cahoon's patent, for attaching to a wagon. One man and a span of horses sow eighty acres per day.

One hand machine, same as last, but operated by hand.

One combined cider press and mill, and one eighteen-inch Buhr stone corn mill for grinding wheat, cracking barley, etc.

The above comprises all goods exhibited by us in the Second Department, many of which were awarded the first premium by the examining Committees.

Of the one thousand dollars offered as premiums in this department, we were awarded one hundred and sixty-six dollars; and a premium of fifty dollars for the best portable steam engine was awarded, "if of California manufacture;" it not being of the requisite make, the premium was very properly withheld.

We think our display the most meritorious, because of the greatest advantage to the future prosperity of the State. The export trade of the State has gradually risen, year by year, on account of the facility with which farmers were enabled, by cheap labor-saving machines, to sow more grain and get it cheaply into market, thus competing with other States. Without the improved machines the farmers on this coast would scarcely be able to supply the domestic wants of the State.

Respectfully, BAKER & HAMILTON.

THIRD DEPARTMENT—MECHANICAL AND DOMESTIC PRODUCTS.

STATEMENT FOR THE MISSION WOOLLEN MILLS OF SAN FRANCISCO.

To the Committee on award of Gold Medal Premiums of the California State Agricultural Society:

GENTLEMEN: The undersigned, in accordance with the regulations of your honorable society, herewith very respectfully submit their claims for the award of the gold medal for the Third Department. We base our claims on the following points:

First—Your Committee on Premiums have reported in our favor: On best display of woollen goods by one factory; on best cassimeres and cloths; on best flannels and best blankets—this being the greatest number of premiums awarded to any exhibitor in the Third Department.

Second—Our mills, in order fully to prove to the world the great progress made by our young State in manufacturing pursuits and to place California in the position she is justly entitled to as a producing commonwealth, have, at great expense and without any prospect of

pecuniary benefit, sent specimens of their goods to the great Paris Exhibition and obtained the only prize medal for best blankets, flannels, etc., awarded to any American factory, thus giving California an honored place among the manufacturing countries of the Old World.

Third—The Mission Woollen Mills, not having heretofore been awarded a gold medal by your honorable society, are entitled to the same, according to the rules adopted for that purpose.

Fourth—We claim that the Mission Woollen Mills are the pioneers of the manufacture of cloth, cassimeres, cloakings, beaver cloth, blanketings for mining operations and fancy flannels, in this State.

We have also done more, not only to stimulate other branches of woollen and cotton manufactures on this coast, but by our demand for wool have been the direct means of enhancing the value of the wool clip of this State fully two hundred and fifty thousand dollars per annum during the time we have been running, viz: since eighteen hundred and fifty-nine, working under great disadvantages, competing with both the Eastern and European manufacturers. The Mission Woollen Mills have, since their establishment, supplied this State and the Pacific Coast with the various articles for military, hospital and other wants; they have also furnished to the United States Government during the war various articles of clothing and blankets; in all cases to the fullest satisfaction of the respective Governments, for which ample proof can be obtained.

We furthermore claim that our assortment of woollen manufactures is so varied in designs, styles of goods, brilliancy and permanency of colors, as to have largely prevented the importation of this class of goods from the Atlantic States and Europe.

Under these circumstances, which we consider have benefited the industry of our State more than other single branch of manufactures in the Third Department, and being the largest consumers of California wool, producers of manufactured goods and employers, directly and indirectly, of skilled and unskilled labor, we ask that the gold medal of the Third Department be awarded us in compliance with the provisions of the California State Agricultural Society, as published in the premium list for eighteen hundred and sixty-seven.

Respectfully submitted.

DONALD McLENNAN,
President of Mission Woollen Mills.

S. L. SIMON, Secretary.

STATEMENT FOR THE PACIFIC WOOLLEN MILLS OF SAN FRANCISCO.

To the Committee on awarding Gold Medals of the State Agricultural Society:

GENTLEMEN: The undersigned, on behalf of the Pacific Woollen Mills of San Francisco, exhibited at the State Fair a large assortment of wool and merino knit goods made by them. On behalf of the Pacific Woollen Mills I claim the gold medal to be awarded in the Third Department of

the late State Fair, for the following reasons, which I think entitles them to the same:

First—The manufacture of knit goods by the Pacific Woollen Mills covers or comprises all kinds and qualities which are used in California or on the Pacific Coast, it being the intention of the mill to compete with all grades of knit goods imported, from the very finest to the coarser fabrics In this we hold a position not taken by any other manufactory in the United States—the assortment of goods we make taking at least four mills to furnish the same in other portions of the Union, while there are some varieties included in our assortment which have heretofore been imported altogether, and not manufactured in the States.

Second—The importations of woollen and merino knit goods on the Pacific Coast, through the single port of San Francisco, annually amounts to over four million dollars—which is fully double the value of the blankets, flannels and other woollen goods which are made by the Mission and Pioneer Woollen Mills of this city combined. The capacity of our mills is now equal to producing four hundred thousand dollars value of goods, working only eleven hours per day; but the machinery ordered and now due will nearly double the production; and by running the mill night and day will turn out nearly two million dollars per annum, as the increase will be had in the manufacture of still finer qualities of goods.

Third—We are using almost all California productions, viz: wool, coal, tallow and soap.

Fourth—We are consuming a better class of wool in our manufactures than is used in the other woollen mills, and have given the highest prices paid for wool this season. We thereby stimulate the wool growers to improve their flocks, and to take more pains to market their wool in better condition, as they get well paid for so doing.

Fifth—We pay a larger percentage for labor in our average manufactures than is the case with any other branch of woollen goods, the amount paid by us being fully double that paid for labor on tweeds, cloths, flannels and blankets now made in California.

Sixth—We have opened a new field of labor to women and girls which has been much needed in the large cities of the State. We now employ fully five women and girls to one man in our business, and pay remunerative wages to the former, which is not generally the case with manufacturers at present. Our system of manufacturing requires the presence of only a small portion of the women operatives at the mills, the larger part doing the work in their own families, the goods being supplied at their homes. We now employ seventy men in the mills, also thirty-four women and girls, and also two hundred and fifty women and girls at their homes. By the latter arrangement women are not taken from their families, nor young girls from the supervision and care of their parents, while they make profitable wages. In this particular, the manufactures of our mills have a moral influence on the rising generation which is much to be desired.

Seventh—We manufacture all grades of goods of better material and workmanship than is usually the case with those imported. We, in making the finer kinds, will require the finest wools possible to raise, and will, by paying remunerative prices, give more encouragement for growers of fine woolled sheep than all the other industries of the coast combined.

Eighth—In the making of merino goods we use the finer grades of cot-

ton, and paying full prices for the same will in time stimulate our planters to raise a better species of cotton than is now called for in the manufacture of brown drills, sheetings, shirtings and Osnaburgs in this State. In fact, the demand thus created in stimulating the producing of cotton will, when successful, be but the forerunner of mills for the making of the finer qualities of cotton fabrics, which are much needed on the Pacific Coast.

Ninth—By the successful manufacture of knit goods, we will in time add an export trade in them to Mexico, South America and Japan, which will stimulate the production of fine wools and cotton, which are now supplied those places from the Atlantic States and Europe.

Tenth—We have invested a very large capital (four hundred thousand dollars) in a new and untried branch of manufactures, and have a powerful interest to contend with in the way of foreign manufacturers, who have heretofore had control of this market. In the long and closely contested struggle which is to ensue we need the indorsement of the State Agricultural Society through the award of the gold medal of the Third Department, which we think, with good reason, should be given to us on account of the merits of the manufactures we represent.

JAMES ROBERTS,
For Pacific Woollen Mills.

STATEMENT FOR THE PIONEER WOOLLEN MILLS OF SAN FRANCISCO.

San Francisco, September 16th, 1867.

To Committee of Third Department:

Gentlemen: The San Francisco Pioneer Woollen Factory, competing for the gold medal of the State Agricultural Society of the Third Department, is the first establishment of this kind on the Pacific Coast. It manufactured the first blankets in eighteen hundred and sixty, and it is now the largest establishment of the kind in the State—running eighteen sets of cards, eight self-acting spinning mules of four hundred spindles each and fourteen spinning jacks of two hundred spindles, making a total of six thousand spindles and working seventy looms. One of their fancy looms to weave checked flannels is at work in the Fair.

The Pioneer Woollen Factory consumes over two million pounds of wool of the best quality only, and encourages the wool growers by paying the highest price for the finest wool grown in the State. For the last three years the factory secured the entire clip of wool raised by Colonel W. W. Hollister of San Juan, Monterey County, known as the best and finest clip of wool in the State, and by securing the fine wools and encouraging the growth of fine merino wools it was enabled to establish the reputation of producing the finest flannels in the State; and the Pioneer Woollen Factory were the first to work their flannel into overshirts and flannel underwear—now running seventy sewing machines on their own premises under their own supervision.

The Pioneer Woollen Factory employs four hundred men and women, disbursing on the average from eighteen to twenty thousand dollars per month for wages alone, while its trade to foundries and mechanics is very large.

The Pioneer Woollen Factory has on their premises the finest steam engine on the coast, made in the State, by the Vulcan Iron Works of San Francisco, and their bill with the foundry alone for new engine, boiler and shafting for the extension of their works amounted, during the past year, to over forty thousand dollars; and it encourages home trade and home manufacture whenever chance affords.

The various articles of manufacture displayed by the Pioneer Woollen Factory compare favorably with the best Eastern and foreign manufactures, and are offered to the consumers at a lower price than even inferior goods could be laid down here from the East or from European markets.

Very respectfully submitted for San Francisco Pioneer Woollen Factory.

AD. BONDY, Secretary.

STATEMENT OF THE OAKLAND COTTON MILLS.

To the Committee of the Third Department:

GENTLEMEN: In consequence of my having to leave here before your action upon the Third Department—mechanical and domestic products—which involves the award of a gold medal, I beg leave to submit the following as a historical account of our enterprise and its progress:

The design was formed in eighteen hundred and sixty-four, and a year of valuable time was spent in the manufacturing States of the East. Before this was done, however, the adaptability of California soil for the production of cotton was pretty well investigated. It is true we expected a larger production of the raw material than has yet been realized, but we are fully satisfied that California can and will produce a sufficient amount in a few years to supply her own and neighbor States their consumption. I may mention that the large bounties offered by the State for the manufacture of cotton goods was a stimulus in our enterprise and an encouragement that I am glad to say has been fully realized.

Our first yard of goods was wove on the first day of December, eighteen hundred and sixty-six. Since then our factory has produced one hundred thousand yards of sheeting, fifty thousand yards of manta, for exportation, and three hundred thousand yards of shirting, made expressly for and manufactured into flour sacks. In doing this we have consumed about fifty thousand pounds of California cotton, one hundred thousand pounds shipped from New York, and about fifty thousand pounds from Mexico and Central America. We would not have had to ship cotton from New York, but, strange as the coincidence may seem, there was a duty of five cents put upon foreign cottons about the time, or very soon after, the machinery was shipped for our factory. It has since been reduced to three cents.

Allow me, gentlemen, as a matter of pride, to utter my firm convictions that at no distant day California will dance to the merry music of twenty thousand spindles.

In regard to our woollen or mixed fabrics: We found there was an entire deficiency in the market of a style of mixed goods which has always been popular and known as Kentucky jean. We provided machinery and began its manufacture—how well we shall succeed is yet to

be seen. I have the satisfaction, however, to say that all who use it speak well of it and give encouragement.

In contesting for the gold medal, all we ask is a consideration of the above facts, and whether we should receive the award or not, we feel very grateful for the generous encouragement we have received at the hands of the California State Agricultural Society.

L. J. RECTOR,
Secretary Oakland Cotton Manufacturing Company.

STATEMENT OF JOSEPH NEUMANN, OF THE PIONEER SILK FACTORY, OF SAN JOSÉ.

To the Committee on award of Gold Medals of State Agricultural Society:

GENTLEMEN: In accordance with your request, I herewith submit my claims for the gold medal to be awarded to the most meritorious exhibition, at the late State Fair, in the department of manufactures. I had on exhibition a silk reel of my own invention, made in this State; a silk loom for weaving dress goods, both in successful operation—the former operated by my son, a boy of fourteen years of age, and the latter by myself. I also exhibited samples of raw and organzine silk made by myself from California raised cocoons. Also, samples of black dress silk goods, manufactured by myself in this State—all of which would compare most favorably with the best imported articles. I may here also mention the fact that the machinery now belonging to the factory which I represent, now in the State and soon to be in operation, consists of the following:

SPINNING DEPARTMENT.

	Spindles.
The following is the inventory of machinery for hard silk work:	
One hard silk winder	44
One hard silk winder	56
One cleaner	46
One doubler	48
One twisting and thrusting mill	126
The following is the inventory of machinery for soft silk work:	
One soft silk winder	32
One soft silk winder	40
One soft silk winder	48
Two soft silk winders (six spindles each)	12
Total	452

Together with all the woodwork belonging to the same, as follows :

Swifts, complete	100
Bobbins of all descriptions	1700
Fly blocks	800
Mill nuts	350
Bobbins for soft silk winding	2000

WEAVING DEPARTMENT.

Complete looms	9
Small looms, complete except woodwork	6
Shuttles (doz.)	6
Rubbers	11
Nippers	10
Shears	7
Lot boxwood spools	1
Warping mill	1
Beaming apparatus	1
Spool wheels	2
Jacks	1
Complete swifts	138

My exhibition, it is true, did not compare in bulk, nor did it make so extensive or magnificent a show at the Fair as was made by some other parties in the same department—the woollen mills, for instance, and the glass factories made exhibitions at once a credit to the State and to the parties making them. They, and more particularly the woollen mills, have been a long time, or a number of years in operation. The raw material which they work up was very plenty and cheap—almost a drug in our markets before these mills were established, while at the same time the articles which they manufacture—such as blankets, the coarse woollen cloths and flannel shirts and drawers—were in great demand, and comparatively very high and expensive, thus promising them a speedy and certain return for the investment of their money. The motives, then, that induced the establishment of the different woollen mills were or may well be considered to have been selfish and strictly pecuniary. They introduced, encouraged and developed no new agricultural industry. They came among us in obedience to an imperative demand, to supply a necessary link or gradation of industry between the producer of the raw material, wool, and the consumer of the manufactured articles made therefrom. They did not even create any greater demand for wool or give to it any better or more certain market, nor cheapen to any great extent the price of clothes or blankets into which they worked up the raw material.

It is true they employed labor, and thus kept among us and distributed wealth among the people of the State that before their establishment, was sent abroad to pay for imported articles. In this they serve the interests of the State only in proportion as they serve their own. Every other industry does the same. The flour mills that convert our

wheat into flour, the sawmills that work our forests into lumber, in fact every department or branch of industry, even the farmer who produces the grain, or the orchardist who supplies our markets with fruit, all stand on the same footing in this respect with the woollen mills, and are entitled to credit for the same degree of merit. The merit of an exhibition does not, in my humble opinion, consist in the bulk or quantity of an article exhibited, nor yet in the amount of capital invested in the business or enterprise that produced it. If so, some extensive grain grower might put on exhibition his whole crop of wheat or barley, and some importer of agricultural implements might move into the exhibition hall his whole stock on hand, and upon these displays base his claim of merit and the medal in his department. The merit of an exhibition must be found in something else. It will be found not always in the intrinsic value of the articles exhibited. Otherwise the banker might place the contents of his spacious coffers on exhibition, and say in triumph, "My gold has a real standard value. It is the article by which the value of all other articles the world over is measured. With my gold you can buy all the necessaries and all the luxuries of life. With my gold you may possess all other things on exhibition. Is there not merit, then, in my exhibition, above all others?" The proper rule by which to determine the relative merit of the different exhibitions will be found in the answer to some of the following or similar questions: Which is entitled to the distinction of originality? Which bears the mark of genius or enterprise? Or which, other things being equal, has been produced at the risk of the greatest personal or pecuniary sacrifice? Again, which is calculated to introduce or further stimulate other new and important industries—looking to the ultimate and perhaps distant success of those new industries for its own support and prosperity? In other words, which is the small beginning that only requires to be encouraged with the fostering care of societies, like that whose agents you are, to enable and cause it to grow up and outstrip all others in the State in the creation of wealth—in the profitable employment of labor—in the introduction and development of new agricultural industries—in the retention and distribution of capital among our people? Indeed, which exhibition is most probably the forerunner of a new era of prosperity among the people, to be created and brought about by its general introduction?

Determined by these rules and considerations, I am firmly of the opinion that the exhibition which I had the honor to make—though comparatively small in some respects—must bear off the palm of merit over any others in the Third Department. It certainly has the advantage of newness and originality over all others. The introduction of the manufacture of silk in this State is certainly attended with a considerable risk, both of time and means. It is fully up to if not in advance of the demand. It must depend to a great degree for its own success upon the introduction and success of another, some day to be the most valuable industry of the State. I refer to the silk culture. The latter cannot be made profitable and cannot therefore become permanent and prosperous without the natural accompaniment and feeder, the silk factory. Encourage, then, the establishment of silk factories, and you send an invigorating and sustaining influence through one of the most important agricultural industries that ever had an existence in any country. No country to which silk culture and silk manufactories are so well adapted as to our State, and in which they exist and flourish as they must at no distant day here, can be found.

Nor can the people in any country where these industries naturally thrive and are encouraged ever want for pleasant and profitable employment. The principal wealth of France and Italy, and even of China and Japan, is traced to the cultivation of the mulberry tree and the feeding of silk worms; and England owes as much of her manufacturing and commercial wealth and importance as a nation to the importation of raw silk and exportation of manufactured silk goods as to all the cotton and woollen mills together. If we examine the commercial reports of our own country we shall find that our silk trade looms up in magnificent proportions. We shall also find in the importation of silk goods the principal cause of the balances of trade being against us and the consequent necessity of shipping abroad our gold and silver to settle those balances. The importation of manufactured silk goods into the United States, as given by official reports, is over thirty millions of dollars per annum.

To show with what solicitude the Government regards this fact and what importance she attaches to the introduction and protection of these silk industries, we need only mention the fact that upon this enormous import trade she imposes and collects a duty or tariff of fifty per cent. ad valorem. So important does our own State regard the introduction and success of the cultivation of silk within our borders that, through her last legislation she proposes to pay for the cultivation of the mulberry trees and the production of cocoons more liberal bounties than have ever been offered by any other State in the world for the encouragement of any industry. This encouragement, like all governmental bounties, is but temporary, and as compared to that permanent and substantial encouragement which the silk factories are sure to extend these industries, is of but little importance. So high among the industries of the State does the Board of Agriculture, for whom you act, hold the manufacturing of silk in this State that, in addition to offering premiums for different articles of silk goods manufactured in this State to the amount of one hundred and thirty dollars, forty of which I won, they tendered and paid me the sum of one hundred and fifty dollars extra, to bear in part my expenses in making the exhibition at their Fair—a compliment I am certain they paid to no other exhibition.

What other exhibition, I am constrained to ask, and ask, too, in the spirit of truth and candor, can show such an accumulation of evidences of merit?

In addition to all these considerations it must be remembered that my exhibition was made by the Pioneer Silk Factory and the only one on this coast. It stands alone to battle with and overcome or be overcome by those difficulties and embarrassments so universally surrounding the introduction of new enterprises into new countries. It must combat with the cupidity and selfishness of the immense capital invested in the import trade of silk goods, and meet and overcome the timidity and exorbitant exactions of capital when asked to invest in new and important branches of industry before it has been demonstrated beyond a doubt that such investment will bring speedy, certain and remunerative rates of profits. It must anticipate and provide against the scarcity and unfair demands of such skilled labor as it must of necessity support and employ.

It is true the premium at the Committee's disposal is of little value intrinsically, but to the silk manufacturing business as it now stands in

this State it is of immense value. Not so with my principal competitors They are thoroughly established; they have a rapidly paying business, the success of which is in no way dependent upon or liable in the least to be increased or diminished by any award the Committee can make. What is a gold medal to the woollen manufacturing interests of this State, represented as those interests already are by no less than four flourishing factories, owned by as many rich and powerful companies? Especially when the profits of the business are so great that as many more companies in different portions of the State are also now being organized for the prosecution of the same business, and capitalists are striving with each other for the most promising location for investment?

It is true, the silk manufacturing enterprise in this State is valuable more for what it promises in the future than for what it has done in the past. And in this very fact, when properly considered, is to be found a very strong point in its favor in competing for the prize held out. It is fully up to or in advance of the demand of the times. It has come to be the leader and creator of other great and valuable industries rather than their creature, and in the material world, among the agencies for the civilization and improvement of mankind is entitled to the same relative position as to merit as in the moral or political world is accorded to the originator and leader in great moral or political reformations. Especially should this be the case in this State, where the industries to be encouraged by the encouragement of the silk factory are principally new branches of agriculture, thus giving variety to the productions of the soil where heretofore too great a uniformity or sameness of production has been the greatest cause of a lack of general prosperity.

I may, I presume, without any impropriety be permitted here to remark that from my own knowledge of the exhibitions in the Fourth Department—agricultural products—my friend Prevost, who represents the silk culture, though he has powerful and very meritorious competitors in the producers of grain and wine, must carry off the prize. And if so, he will win that distinction principally upon the very just ground that he is the pioneer in that most valuable industry of the State. Should he be successful, as I have no doubt he will, then the justness of my claim must come home to the Committee with increased force.

Regretting my inability to present my views and my claims in as strong and comprehensive a style as I believe the merits of my exhibition warrant and allow, and hoping the Committee will recognize the great merits of the industry represented rather than the defects of my meagre statement of them, I will leave the subject for their candid consideration and decision.

JOSEPH NEUMANN.

STATEMENT OF J. D. BOYD, OF SAN FRANCISCO, IN FAVOR OF "LAUREL WOOD."

To the Committee of the State Agricultural Society on award of Gold Medals:

GENTLEMEN: The undersigned, a competitor for the gold medal to be awarded by the State Agricultural Society to domestic manufactures of the highest merit and greatest importance, respectfully submits his claims to be partly as follows:

That by his agency and enterprise, which has involved an outlay o both time and money, he has succeeded in rescuing from our "native forests," where it had been so long neglected, the now world-renowned "laurel wood of California."

That by virtue of his peculiar skill he at once invested it with a value it did not previously possess. He brought forth those latent beauties that were hitherto unknown and undiscovered, unfolding to the beholder that multiplicity of rare and exquisite tints that justly entitles the California laurel to be now and hereafter designated as the "gem of the forest."

That he has at his personal expense forwarded to the Paris Exposition a door manufactured from this material, besides various polished specimens of the wood itself, thus demonstrating to the assembled people of the earth there congregated its peculiar fitness for the manufacture of elegant and superb articles of furniture. As anticipated, the verdict there, freely pronounced, was highly complimentary to this other new product of our young State.

These were methods he had recourse to in order to at once familiarize the public with its peculiar qualities, with a view of early attaching to it a commercial value. In this connection it affords him great satisfaction to be able to communicate to you that his exertions have been rewarded with success, having recently been addressed from Liverpool by various parties on the subject of price and supply of this wood; and from the Eastern States have received *bona fide* orders from sundry parties, two of whose names he will here take the liberty of giving, they being well known to the people of this coast, namely: Mayor Fargo, of Buffalo, of the firm of Wells, Fargo & Co., of this city, and the other is no less a personage than Benjamin Holladay, Esq. Both of these gentlemen design having this wood converted into parlor sets and other interior decorations of their magnificent mansions.

He has also had great success in overcoming the local prejudices which uniformly retard the introduction of articles of domestic manufacture, especially if designed to supplant others that have the prestige of long use, as well as having been the products of foreign countries. In support of this assertion he can point to the cabin of the Government steamer McPherson, where laurel is used exclusively; also, to the ladies' cabins of the California Steam Navigation Company's steamers Capital and Julia; also the office of the Pacific Insurance Company—laurel being there used in the front doors, the windows, the wainscotting, the desks, the counters—in fact, in all its varied equipments; and the unanimous verdict of the public is, that the Pacific Insurance Company's office is the most elegant establishment of the kind on the American Continent.

In the office of the Alta California is to be seen the first counter ever made from this material; and the good taste that selects laurel for a counter has since been indorsed by the numerous subsequent orders for other counters of the same material. An order has also been received from Thomas Mooney, President of the Builders' Insurance Company, to furnish his private residence throughout with furniture made from this material. There is, in fact, a decided preference in its favor for furniture of all kinds; but as only seasoned wood is adapted to manufacturing purposes, a large demand cannot be at present supplied. Time and capital, however, will remedy this impediment; then it will at once come into general use in the manufacture of household furniture of all descriptions. The revenue that this will afford to the State is best indi-

cated by the amount we annually pay for imported furniture, which reaches the very considerable sum of three millions.

The sound policy of diverting that large amount into reproductive channels of our own is obvious, as it would increase the demand for both skilled and unskilled labor. Besides, the revenue of individuals being the regenerating source of public revenue, whatever contributes to enhance the former sustains the latter, and nothing tends to attract population more than providing the means for its subsistence.

I will finally add that, so far as the introduction of this new product contributes to the satisfaction of human wants, so far as it enlarges the sphere of labor, or of reproductive exertion, so far its normal value has been enhanced, or whatever commercial prominence it may attain in the future, or whatever pecuniary benefit the people of this coast may derive from its introduction, I claim that they will flow from and be the legitimate result of my first discovery of its useful properties, followed by my subsequent vigorous and persistent efforts to secure for it public recognition; that those efforts have not been abortive nor valueless may be deduced from the foregoing.

He contends that, as every new source of wealth should be especially welcomed and encouraged until it be advanced to a point where it can take care of itself, therefore it is meet and proper that the skill that brought this new product to its present high state of perfection should be in some way recognized and rewarded by your society.

The award of a gold medal would be a valuable aid, as it would add to its present prestige and greatly facilitate its introduction; moreover, in an economical point of view, this product has superior claims to your favorable consideration, not having cost previous human exertion, but the gratuitous product of natural agents—the productive services of the soil; not so with many other commodities, even wool is the joint product of the owners, the shepherds' care and capital.

Past experience in all countries, and in all ages, proves that capital is most profitably employed in developing those sources where nature concurs most in the production; the soil, the air, the rain, the sun, has elaborated the glorious tints of the precious "laurel wood," that an English writer aptly compares in its startling effects to a "beam of sunlight reflected from a lake of mottled gold."

Nature, with her inexhaustible gifts, is incessantly laboring in our behalf, daily and hourly proffering us her services and co-operation in our labors, which, if intelligently appropriated, would go far towards ameliorating the condition of millions of the human family. It is then in the capacity of a co-worker with nature wherein his chief merit consists. It is a case where human ingenuity has been successful in communicating to one of nature's products properties of universal utility as well as greatly augmenting its former value. Again, its subsequent conversion into articles of convenience and use will greatly enlarge the opportunities and profits of labor, add to the State revenue, provide for increase of population, retain three millions of coin that we send yearly out of our State to purchase such articles as "laurel" is susceptible of being converted into, and that our mechanics can now provide us with both cheaper and better.

It is purely consideration for the public good and general welfare that prompts me to lay this matter before you, with the view of securing

your valuable co-operation in advancing this new source of wealth, that he unaided has had the honor of taking the initiative.

All of which is respectfully submitted.

J. D. BOYD.

STATEMENT OF THE PACIFIC TANNERY AND BOOT AND SHOE COMPANY, OF SAN FRANCISCO.

SACRAMENTO, September 17th, 1867.

To the honorable members of the Committee on Gold Medals:

GENTLEMEN: The undersigned, representing the Pacific Tannery and Boot and Shoe Company, of San Francisco, would respectfully represent and submit to your careful consideration that the said company but being organized since May of this year, and using the leather from its own tannery (ninety days being at least required to tan leather), have exhibited at the State Fair the largest assortment of men's nailed, screwed and pegged boots, both in calf and kip skin; men's screwed and pegged Congress gaiters; men's screwed and pegged brogans, men's screwed and pegged Oxford ties; and ladies' balmorals, from scarlet cloth, blue and white silk; glove and French kid, all foxed; calf double sole and goat skin; also, Misses' calf and goat skin balmorals. That, independent of said company exhibiting the largest assortment of goods manufactured by any company in the State, notwithstanding the company has but recently commenced operations, the company exhibited a certain class of goods not even ventured by others though older in experience and existence—said goods being screwed kip and calf boots, brogans, Congress gaiters and Oxford ties. The company is entitled to special considerations at your hands for the following reasons:

First—We tan our own raw material.

Second—We make screwed work in competition with foreign importation.

Third—We make from a miner's boot to a calf skin dress boot, screwed, pegged and nailed.

Fourth—We make screwed brogans.

Fifth—We make screwed Oxford ties.

Sixth—We make screwed Congress gaiters.

Seventh—We make nailed Oxford ties.

Eighth—We make nailed Congress gaiters.

Ninth—We make the largest assortment of ladies' balmorals, plain and fancy.

Tenth—We make Misses' balmorals.

Eleventh—We are not only in competition with foreign and Eastern importation, but we compete with home manufacturers in the following way:

First—We employ white labor only (and use machineries to reduce the labor system), and not the coolies.

Second—We are not confined to a special line of goods in the trade.

Third—We are not only manufacturing boots and shoes from the raw material tanned at our tannery, but we select the best stock only, and

inferior goods of raw material are either sold to leather dealers in San Francisco or shipped for manufacturers East.

All of which is respectfully submitted.

B. PULVERMAN,
Secretary Pacific Tannery and Boot and Shoe Company.

STATEMENT OF M. M. COOK & SON.

San Francisco, October 23d, 1867.

To the Committee on award of Gold Medals of the State Agricultural Society:

Gentlemen: The undersigned, exhibitors at the State Agricultural Fair, beg leave to offer for your consideration a few facts relative to their business, and in substantiation of their claim to the honor of the society's gold medal:

First—That they consume one thousand sides of California leather per month.

Second—That notwithstanding the small proportion which labor in their work bears to the material, they give steady employment to fourteen men, besides the many employed in preparing the leather—all of them trained and skilled mechanics, making only the best class of goods, which, by diligence and close attention, they are enabled to put in the market at prices successfully competing with Eastern importation, as well as the inferior home productions of Chinese and prison labor.

Third—That they are sending large quantities of their hose and belting to China and Japan by every steamer, thus driving the European manufacturer from one of his best markets.

Lastly, that they have brought their business to this successful condition after six years battling, through the press and otherwise, with deep rooted prejudices and still deeper interests against California leather. That they have always had the highest confidence in its superiority, and after their long experience are more than ever convinced of it.

They have abundant testimonials from all parts of the coast to the good qualities of their hose, and inclose a copy of one received from the Sacramento Fire Department.

With these few facts they submit their claim.

M. M. COOK & SON.

COPY OF TESTIMONIAL FROM SACRAMENTO FIRE DEPARTMENT.

Sacramento, September 16th, 1867.

M. M. Cook & Son, San Francisco:

Gentlemen: In answer to your request that we should test the hose exhibited by you at the State Fair, we can assure you that there is no

need of such trial, as we have been using your hose in our Department during the past four years, and can say, for the information of all interested in such matters, that it has given us the most perfect satisfaction.

Yours, truly,

WILLIAM GILLEN,
Chief Engineer.

D. C. WILSON,
JOHN DONNELLAN,
GEORGE SCHMEISER,
Ex Chief Engineers.

STATEMENT OF BUCKINGHAM & HECHT OF SAN FRANCISCO.

To the Committee to award Gold Medals of the State Agricultural Society:

GENTLEMEN: The undersigned entered and exhibited at the late Fair of the State Agricultural Society ten cases of boots and shoes of their own manufacture, in competition for the several premiums offered by the society and State Legislature, and learning that the Committee of Awards are to meet on the first proximo to decide upon the relative merits of the numerous applicants for the gold medal to be awarded by the Agricultural Society, respectfully submit to the Committee the following facts connected with our business as manufacturers of the articles above mentioned and exhibited as samples at the late Fair of your society, to wit: Total number boots made during year ending September first, eighteen hundred and sixty-seven (in round numbers), seventeen thousand pairs; shoes, two thousand pairs. Consumed forty-eight thousand pounds, or two thousand four hundred sides, of twenty pounds each, of sole leather; four thousand kips; one thousand two hundred calfskins and one thousand sheepskins—all of California tanned leather. Finding the supply of California made calfskin inadequate to the present demand, we found it necessary to use French manufacture, of which we have imported and consumed during the year upwards of one thousand eight hundred skins. Our experience has fully proven that all California leather, other than calfskins, is superior to any imported. The reason why this does not hold good with calfskins also, is not easily made plain to the uninitiated. It may suffice your Committee to say that from the knowledge we have of the matter, we believe that a very few years time and experience will surely remedy the fault.

Average number of men employed during the year past is fifty-five, to whom we have paid for labor about forty thousand dollars. Our experience justifies us in stating that Chinese labor cannot be used in the manufacture of first class goods in our branch of industry, hence we do not employ any but white men. These few facts we cheerfully submit for the consideration of your Committee, and would add that the goods exhibited at the late Fair were not the result of any effort for the purpose, but were designed to show to your Committee and the public just such goods as we are daily manufacturing and have for sale.

We would further add a fact which may affect the deliberations of your Committee, namely: that Mr. Buckingham—member of our firm—claims to be the pioneer wholesale manufacturer of California, he having been

the senior partner of the firm of Buckingham & Company, working in eighteen hundred and sixty-three at the State Prison under a contract for convict labor obtained by George K. Porter, Esq., and that he has most of the time since then, although under different names and connection, been so engaged.

Very respectfully,

BUCKINGHAM & HECHT.

STATEMENT OF S. P. TAYLOR, OF SAN FRANCISCO.

To the Committee on award of Gold Medals in Third Department:

We herewith present our claim to the gold medal to be awarded to the Third Department—mechanical, manufactured and domestic products—of the State Fair held at Sacramento in September, eighteen hundred and sixty-seven. We support our claim to this premium on the following grounds:

As a domestic manufacture—employment is given to an average of fifty persons directly, and to a large number, estimated at four hundred, who but for the existence of the Pioneer Paper Mill would be dependent upon the charitable institutions of the country. This latter class is also of great value to the community. In their daily rounds a large quantity of what otherwise would be deemed rubbish is collected and converted into money. Hence an amount equivalent to seventy-five thousand dollars per annum, independent of another enterprise hereafter mentioned, is retained in the State, of which amount ten thousand dollars is annually paid to rag gatherers who gather up what has been thrown away as worthless; employment is given to a large number of people and saving hundreds from beggary and possibly starvation.

A year ago the capacity of the mill was increased; we were therefore enabled to take an interest in a projected enterprise of paper bag manufacturing. The use of paper bags is becoming general, although it is a trade started but a few years, and they are now almost as indispensable as the article of paper itself. In view of the fact that so large an amount of money is annually sent East for paper bags, and their use constantly growing into public favor, we felt assured of the success of an enterprise of this kind. The result is, thirty-five thousand bags of all sizes are made daily, giving employment to an additional force and keeping forty thousand dollars in this State which otherwise would be sent East. It is a step in the direction of a self-sustaining community, and although the enterprise is in its initial year, any doubts which we entertained at first in regard to its success are dispelled. In addition to this the interests of the Pioneer Paper Mill are identified with our sugar and borax refineries, candle and soap manufactories, woollen mills and other domestic institutions. The miner carries its products with him to the bowels of the earth for cartridges for his blast; the vintners are among its patrons, who use a peculiar kind made for them for extracting the impurities of their wine, and the newspapers and publishers speak in high terms of the excellence of its product. As Californians, we are proud to say that almost the entire work of our Legislature at

the session of eighteen hundred and sixty-five and eighteen hundred and sixty-six was printed on paper made at the Pioneer Paper Mill.

The simple article of paper—so general in use in all pursuits—what is it? It is within the reach of all. Every person uses it; but in our attention to business little is thought of its value. In all the pursuits of life the article has become so common that its importance to the world is for the most part lost. What can the "Art preservative of Arts," the lawyer, the merchant, the mechanic and the thousand and one branches of trade do without it? Take it away from us and we would feel its loss almost as much as the loss of our daily bread.

As to the merit of our paper, it has in every exhibition where it has been displayed been awarded the highest premium over all others.

Having given our reasons—its value to the State at large as a domestic institution financially and to the poorer classes beneficially—why it should be awarded the gold medal, we feel justified in asserting that our claims are of a character superior to those of any other domestic manufactory.

Here we leave it to the impartial judgment of your Committee to decide.

Very respectfully,

S. P. TAYLOR & CO.

STATEMENT OF MARTIN L. HAAS.

San Francisco, October 14th, 1867.

To the Committee on Awards of Gold Medals in the Third Department:

Gentlemen: As one of the exhibitors at the late Fair held by the State Agricultural Society at Sacramento, I herewith present my claims to your consideration for an award of the gold medal belonging to the Third Department of said Fair. I claim that the branch of manufacture exhibited by me is one of, if not the most important of the industries of the State which were represented in the Third Department.

The entire population of the Pacific coast, comprising the States of California, Oregon and Nevada, and Washington, Arizona, Idaho, and parts of Montana and Utah Territories, derive their supplies of white shirts through the single port of San Francisco. These importations are made through so many different channels that no positive statistical knowledge of the exact quantity or value of the same can be had, but they can be estimated approximately, as follows:

The population of the States and Territories named who procure their supplies through the Port of San Francisco number about seven hundred and fifty thousand persons in all. Allowing for women, girls, and male children under fourteen years of age, there are at least two hundred and fifty thousand male persons of the population who use white shirts, and as the people of the Pacific coast are noted for their prodigality and careless habits, the consumption of this article of clothing is in excess of any similar number of population in other portions of the Union. To this wastefulness is to be added the destructive manner in which the

greater part of the washing of clothes is done, viz: by the use of corroding acids, called washing fluids, and the Chinese barbarous method.

From these causes I estimate that two hundred thousand adults require an average of eight white shirts per annum, while the other fifty thousand classed as boys between fourteen and twenty years use at least the same quantity per head during the same period of time. This will make say one hundred and thirty-three thousand dozen men's and say thirty-five thousand dozen boys' white shirts per annum, or an average of fourteen thousand dozen per month. To make these shirts will require the constant employment of twelve hundred women, machine sewing, six hundred and fifty women for hand sewing and two hundred laundrymen to prepare goods for market, thus giving employment to eighteen hundred and fifty women and two hundred men in those branches of labor. The making of collars and cuffs, which is separate from the above, would give employment to four hundred more women, to which cutters and forewomen added, makes a total of twenty-five hundred persons who would derive profitable employment if home manufactures were to take the place of importations.

The manufacture of these shirts would give profitable employment to a large class of persons whose pay, in my present business, averages as follows: First class work, bosoms, twelve dollars to fifteen dollars per week; machine operators, from nine dollars to twelve dollars per week; hand-workers, seven dollars to ten dollars per week; laundrymen, fifty dollars to seventy-five dollars per month and board, while cutters and forewomen get extra high wages, according to their capacity. The average value of the white shirts sold in California is about twenty-four dollars per dozen, ranging in price from eighteen dollars to thirty-six dollars per dozen at wholesale.

They therefore represent a total value of over four millions of dollars per annum, the great bulk of which amount at present leaves the State. Of this great value fully one half is expended for labor, while the linen and cotton used come from Europe and the Atlantic States respectively.

One of these articles (cotton) we can expect, in time, to produce in California, as the raw material can be successfully raised. When there is machinery in the State to manufacture the fine varieties of cotton goods used for white shirts there will be a sufficient incitement for planters to engage in the culture of the finer grades of cotton, which does not exist at present. In this respect I claim that the successful manufacture of white shirts will prove a primary cause in the production of fine cotton and the manufacture of fine cotton shirting and other goods. California possesses a soil and climate well adapted to the production of the finer grades of textile fibres, and it is the interest of her people that she raise and manufacture all great staples of commerce suited to the wants of her population.

It may here be proper to state that my establishment is by far the most extensive of its kind on the Pacific Coast. The shirts made by me comprise all grades in use and are made of standard goods, and have a recognized commercial value in the market similar to the different styles of imported goods. The same materials are always used in the manufacture of the different styles of shirts, so that purchasers, by asking, can always have exact duplicates at any time desired. I commenced manufacturing in January last and put my goods on the market in April. My sales the first month were about one hundred dozen, but have steadily increased, so that I average over five hundred dozen per month at present, competing with imported goods at similar prices. In my manu-

facture I now use monthly fifteen thousand yards of the best regular brands bleached shirting made in the New England States and thirty-five hundred yards fine linen, which I import direct from Europe.

In conclusion, I again claim the gold medal of the Third Department on the grounds of importance of manufactures which will give employment directly to over twenty-five hundred persons, and indirectly, in time, to as many more, through the growing of cotton and manufacturing it into cloth. I have to encounter a strong opposition with importers and need the marked indorsement of public spirited societies like your own to encourage me in my struggles to benefit the people of the State.

All of which is respectfully submitted.

MARTIN L. HAAS.

STATEMENT OF THE SAN FRANCISCO GLASS WORKS COMPANY.

San Francisco, October 20th, 1867.

To the Committee on the award of Gold Medals for the State Agricultural Society:

Gentlemen: In accordance with public notice to exhibitors at the late State Fair, given through its Secretary, the undersigned herewith present their claims to your body for the gold medal which the Agricultural Society has authorized you, as its agent, to award to the most deserving exhibit made in the Third Department of the late State Fair.

Your memory will enable you to call to mind the exhibit of flint and colored glassware made by us on that occasion, comprising about one hundred articles of different patterns and construction, all of which were made at our works on Townsend street, near the foot of Third street, in San Francisco, and which comprised prescription bottles from one half drachm to sixteen ounces; also oval, panel and fluted prescriptions; extracts, oil bottles, ink bottles, mustard bottles, both plain and French; also wine bottles, soda and bitters bottles of colored glass; also carboys and retorts, the latter both plain and tubulated; chemical ware in great variety, such as flasks, matrasses, tubing, funnels, proof bottles, oil sample bottles; also lamp chimneys of all sizes, as well as locomotive and light-house chimneys, etc.

We beg leave to call your attention particularly to the fact that all this large variety of patterns and colors were produced from a single furnace—a work which has never before been accomplished with the same economy in the history of glass making. The means by which this is accomplished is a matter of our own invention, which will hereinafter be more particularly alluded to.

For this exhibition we claim the gold medal to be awarded to the Third Department, and for the following among other reasons:

We have been the first to introduce upon this coast the manufacture of flint glassware; and to make its introduction successful, we have been compelled to depart from the usual routine of glass manufacture in order to meet the special wants and necessities of the people of the Pacific coast, whose isolated position and paucity of numbers render it neces-

sary that the variety of work which, in other countries, is distributed among a number of different establishments, must of necessity be comprised in one. This has been done at great hazard of pecuniary loss, and only by the employment of a rare combination of skill and experience.

In the establishment of any new enterprise of special importance to the public, the projectors are entitled to credit and encouragement in some respects commensurate with the difficulties to be encountered. It is a fact quite universally admitted that the business of flint glass making, even under the most favorable circumstances, is liable to more inherent contingencies, to be more carefully and constantly guarded against, than, perhaps, any other industry known to man. Unlike most other branches of industry, this is governed and aided by no motive power, and has no analogy to the productions of labor by the aid of machinery. Constant care and attention, directed by skill which can be acquired by experience alone, and a large outlay of capital, are here the only conditions of success.

There is no regular business where, in proportion to the capital employed, greater liability to loss is incurred, none demanding more untiring vigilance on the part of its immediate directors, none requiring so much personal skill and interest in the work. Hence it is that so many failures have occurred in the establishment of the business, both in this country and in Europe. It is a well known fact that nearly or quite two thirds of the efforts to establish flint glass manufactures in England have proved failures, and mainly through the lack of skill or want of application on the part of those in immediate charge, as managers or superintendents. The history of the business in our own country has been generally unfortunate. On this coast, no better success has attended similar efforts, as will be shown in the sequel. In no other business is success more dearly bought or more deserving of being honored and encouraged.

The ingredients of which glass is composed are taken from the earth in a form which is next to valueless until manipulated by the glass manufacturer. None of these ingredients are transparent by themselves. To make them perfectly so requires the highest skill of the mixer. The proper proportions of materials and the necessary degree of heat to submit them to must be made a matter of constant study and experience. It is in these manipulations and this experience that the chief skill of the glass worker is called into action. Formulas and receipts from the books are of no avail for this work, and cannot be depended on. Such dependence, or on that of faulty experience, is the usual cause of failure.

The incessant variations of Nature in her productions, and the difficulties of determining and controlling high degrees of heat, call for the highest and most careful exercise of human judgment. This tact, if it may be so called, is rarely to be found, and when found is with difficulty imparted to others. So rare is this acquirement that in a large glass establishment in Massachusetts, employing some seven hundred or eight hundred hands, the success of the whole establishment depends upon the skill in the above particular of one man, or, in his absence, singular as it may appear, upon that of his daughter. When such skill is found it is, or ought to be, duly prized. It need not be mentioned that without this kind of experience the manufacture of flint glass could not have become a success on this coast. Hence, the presence here of such skill should be warmly encouraged, especially as it exists in a form and to an extent which insures, as fast as pecuniary means and encouragement can be obtained, the ability of the San Francisco Glass Works to add to

their present variety of manufacture that of all the other varieties employed on this coast.

The San Francisco Glass Works are conducted by two practical and experienced men, with but limited capital for the extension of their business into the numerous branches demanded by the wants of our people. The proprietors have had a severe and protracted struggle to build up their business to the present extent, not the least part of which has been in consequence of the efforts of Eastern manufacturers to keep the white glass business of this coast entirely in their own hands by breaking down our incipient efforts at manufacturing it here. In our efforts to secure the trade for ourselves, skill and industry have had to take the place, in a great measure, of capital. It is with pleasure and pride that we refer to what we have accomplished in this direction. The display which we were able to make at the late State Fair furnishes the fullest evidence of our ability to meet the fullest wants of this coast in our line, provided only a reasonable degree of encouragement is extended to us on the part of the people.

We feel confident that with such encouragement the day will soon come when our citizens can have every article of glass which enters into consumption on this coast made in our midst, and thus be placed independent of foreign or Atlantic made goods.

There exist here all the necessary materials, and a small portion of the capital that is yearly spent in California in wild and visionary schemes, if invested in this and similar legitimate enterprises, would be productive of incalculable wealth, would save millions to the State, and add immensely to the prosperity of our rapidly growing cities and towns.

The San Francisco Glass Works now employ about forty hands and have already the capacity for making one hundred thousand dollars worth of glass per annum, the amount and character for producing which are about as follows: Nine hundred tons of coal, two hundred cords of wood, two hundred and fifty barrels of crude petroleum, three hundred tons of sand, one hundred and fifty tons of soda ash, eight hundred barrels of lime, two hundred tons of old glass, one hundred and fifty tons of fine clay, besides red lead, saltpeter, arsenic, manganese, etc. It will be seen from this enumeration that nearly everything required in the manufacture is produced in our midst, giving employment to a great number of outside hands, so that the entire cost of the glass produced here may be set down as about so much value created here, the transmission of which to the East in bullion is saved to the State.

We have little or no data by which to calculate the annual value of the glassware on this coast; certain it is, however, that it is very large, forming an important item in our imports. Perhaps no better idea of the amount consumed can be formed than by referring to the large amount of broken glass which finds its way to our establishment monthly, almost all of which is from wholesale dealers and importers of glassware, in whose hands it accumulates from breakage in store or in transportation thither. A small portion only of broken glass is collected from private families, on account of the great cost of such collection, and the notorious lack of economy on the part of California housekeepers and others in their general neglect of saving anything in the shape of waste. The average amount of our monthly purchases of broken glass is about seventeen tons. This great loss, mostly from breakage in transportation, presents a most important reason for the necessity of such manufacture on this coast.

We would conclude by asking particular attention to an important feature in our exhibition, with which at least a portion of your Committee are familiar, and which all will probably be able to call to mind. We refer to a patent glass pot, the invention of Mr. C. Newman, one of the proprietors of the works, and which has been patented by him as a California invention.

In establishing the business on this coast, as has already been remarked, it was found necessary, for several reasons, to embrace, as far as could be done, all the possible varieties of manufacture in one establishment. In carrying out this idea we found it necessary to accomplish, with variations in the melting pot, that which has elsewhere ever been done by differently constructed furnaces. In no other establishment than our own has the glass manufacturer been able to produce, economically, in the same furnace, both flint and common glass. We have been able to do this by the peculiar construction of the melting pot, a model of which was included among our articles of exhibition as above alluded to. This invention we claim as one of the most important which has been introduced into the glass business for many centuries. Its value has already been acknowledged by practical glass manufacturers.

It is impossible, within the limits of this statement, we fear already extended beyond the patience of the Committee for its perusal, to give anything like an intelligent description of this invention and its advantages. Suffice it to say that we consider it the most important item of our exhibit, and of itself sufficiently meritorious to make it worthy of especial consideration in making up the award for the Third Department.

In conclusion, the undersigned would beg leave to state that we entertain a most lively appreciation of the benefits which must accrue from the awards of the Committee, and feel most sensibly our need of the indorsement of the society which you represent as an encouragement for a proper continuance of the arduous struggle in which we are still engaged, in the effort to place upon a proper foundation on this coast the more difficult branches of a most useful and important branch of industry.

Believing, for the reasons above cited, and for numerous others which might be adduced, that the award of the Third Department fairly belongs to us, we earnestly ask your particular attention to our request, hoping and believing that it will meet with your most hearty acquiescence and approval.

In the meantime we are, very respectfully, yours,

CARLTON NEWMAN,
For the San Francisco Glass Works.

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MANUFACTURE OF GLASS

Perhaps the following brief summary of the history of glass making may be considered by the Committee of sufficient interest to merit a place in the Agricultural Society's forthcoming report, although it is not offered as any part of the above communication:

Very few, if any, branches of industry have contributed more than has glass making to the advancement of the sciences. To this industry is especially due the great progress which has of late astonished the

world in the science of astronomy. It has revealed the wonders of the heavens—the sun, the moon, the planets and the stars are followed in all their phases and movements with a most astonishing accuracy—while with the microscope the naturalist has discovered innumerable phenomena among the minutiæ of creation. Muspratt says that "the discovery of glass is, without contradiction, one of the most important services which accident or chemistry has rendered to civilization." Another writer says that "the importance of glass and the infinite variety of objects to which it is applicable, cannot be exaggerated; indeed, it would be extremly difficult to enumerate its properties or estimate adequately its value. This transparent substance, so light and so fragile, is one of the most essential ministers of science and philosophy, and enters so minutely into the concerns of life that it has become indispensable to the daily routine of our business, our wants and our pleasures. It admits the sun and excludes the wind, answering the double purpose of transmitting light and preserving warmth; it carries the eye of the astronomer to the remotest systems of space; through the lenses of the microscope it develops new worlds of vitality, which, without its help, must ever have been imperfectly known; it renews the sight of the old, and assists the curiosity of the young; it empowers the mariner to descry distant shipping and trace far-off shores; it preserves the light of the beacon from the rush of the tempest, and softens the flame of the lamp on our tables; it supplies the revel with those charming vessels in whose bright depths we enjoy the color as well as the flavor of our wine; it enables the beauty to survey the charms of her person; it reflects, it magnifies, it diminishes; it is a medium of light and of obscuration; its uses are without limit; and as an article of embellishment, there is no form into which it may not be moulded and no article of luxury to which it may not be adapted."

The discovery of glass is lost in the depths of antiquity. Pliny ascribes its discovery to the Phœnicians. He tells the story of a vessel of that nation which had been driven ashore, the crew of which made a fire of seaweed on the sandy beach, the heat of which converted the saline material and sand into a coarse glass. The story is no doubt a fiction. The origin of glass was more probably due the early process of assaying silver, or rather obtaining that metal from argentiferous galena, from which description of ore the chief part of the ancient silver was doubtless obtained. Carbonate of soda, a natural substance, was doubtless a flux in those operations; and nothing is more reasonable than to suppose that with the use of this flux, in the presence of great heat, the oxide of lead, which would be formed from the ore, and the silica, either of the crucible or the ore, might form a glass, the utility of which would have been readily observed by the ancient workers in precious metals. Being obtained in small quantities, it was readily cast or shaped into small ornaments, such as beads, etc., which have in modern times been found in the ruins of Thebes, Nineveh and Babylon. On some of these small ornaments have been found hieroglyphics, which fix the date of their origin as far back as fifteen hundred years before the Christian era.

For many years glass must have been made only in small quantities; in no other way can we account for its having been so costly and rare—its price being much above the value of gold. It has been stated that Nero paid for two glass cups a sum of money equal to two hundred and fifty thousand dollars in our currency.

The first establishments to make glass on a large scale were located at Tyre, near the mouth of the River Belus, where very pure silica was

obtainable in great abundance. The "ships of Tyre" were often freighted with this beautiful ware, which was thus transported to different parts of the world. Many years afterward the art was carried to Rome, and from thence to Bohemia and Venice, where glass was greatly improved in quality. From Venice it was next carried to France, where the Government, with a wise forethought, gave it great encouragement by creating the glass makers noblemen and giving them, for many years, the exclusive right to manufacture glass in that country. In the year sixteen hundred and seventy, the Duke of Buckingham became the patron of the art in England, and greatly improved the quality of glass. He procured a number of Venetian glass makers and settled them down in London. The Government gave them liberal bounties in cash upon all glass exported or sold by them for export. By this means they became the successful rivals of the Venetian and French manufacturers, even in foreign markets.

In the year seventeen hundred and forty-six, the glass business was started in America, at Jamestown, Virginia; but the first successful establishment was in Massachusetts, started in eighteen hundred and three. That State, in order to encourage the business and to secure its firm establishment, gave liberal bounties on all glass made at those works. The business steadily increased from that time forward, until to-day there are about two hundred establishments in various parts of the Union, producing over twenty five millions of dollars worth of glass annually. There are about fifty glass works in the City of Pittsburg alone, which manufacture about seven million dollars worth annually.

It is an interesting and important fact to note that the glassware made in the United States is considered equal to any in the world. At the International Exhibition in London in eighteen hundred and sixty-two, the United States carried off the first premium for the best quality of glass; and again at the present Paris Exhibition we have been victorious, the first premium having been awarded to J. B. Lyard & Co., of Pittsburg.

The first glass works on the Pacific Coast were started in eighteen hundred and fifty-nine, by Baker & Cutting. These works were located on Beale street, and produced only the common varieties of glass—green and black. These works were soon discontinued, the company sustaining heavy losses. The next attempt was made by Lambert & Company, on Fourth street, who also made only common glass. This establishment was also soon closed. In eighteen hundred and sixty a small experimental furnace was started at North Beach, which was soon closed, and the company reorganized as a joint stock concern, under the name of the Pacific Glass Works, with a capital of one hundred thousand dollars, which was soon increased to one hundred and twenty-five thousand dollars. This company also meeting with heavy disappointments was dissolved, and the works are now carried on by private parties. These works manufacture common glass only. In March, eighteen hundred and sixty-five, C. Newman and P. T. Brennan started the flint glass business on Townsend street, between Third and Fourth streets, being the first attempt to make flint glass on the Pacific coast—which has since been enlarged and increased until they have now a large establishment, making flint and German flint, as well as common black or green glass. They have a large furnace, containing eight pots, which hold one thousand four hundred pounds of glass each, and employ forty hands. They manufacture about two million bottles and vials annually, valued at about one hundred thousand dollars.

STATEMENT OF CRANE & BRIGHAM.

San Francisco, October 14th, 1867.

To the Committee on awarding Gold Medals at the State Agricultural Fair of 1867:

Gentlemen: We, the undersigned exhibitors at the late State Fair at Sacramento, hereby make claim to the gold medal to be awarded to the Third Department of said Fair. We claim that we were the only exhibitors of sulphate of copper (blue vitriol) at the late State Fair, and that the article which we are manufacturing in San Francisco from copper ore is not only equal to any but superior to the most that is imported. We have, at a great expense, succeeded in manufacturing an article of which upwards of three hundred tons are annually imported, all of which we can supply at a less price than it can be imported for. It is largely used to prevent smut in wheat and in the reduction of silver ores. Its value to the wheat crop of California is scarcely to be overestimated, as in large part the reputation of the grain of our State is owing to its use. During the years eighteen hundred and fifty-three, eighteen hundred and fifty-four, eighteen hundred and fifty-five and eighteen hundred and fifty-six our grain was badly injured by smut, which the use of blue vitriol has remedied.

We believe that the article we exhibited entitles us to the award of the gold medal of the Third Department, and ask the same at your hands.

Trusting you will consider the matter in question and return us a favorable answer, we remain,

CRANE & BRIGHAM.
Per Sanford.

STATEMENT FOR THE CALIFORNIA POWDER WORKS.

To the Committee on award of Gold Medals in the Third Department:

Gentlemen: The manufacture of blasting and gun powder has now become a distinctive feature among the productions of the Pacific Coast, and may now well be said to be firmly established, having gone steadily forward from the time of its commencement to the present, and has won for itself a name and reputation that have triumphed over all opposition, which, however friendly, was none the less sharp and energetic.

The difficulties attending the establishment of a new branch of manufactures in any country is only known to those who are the pioneers in such enterprises. The manufacturers abroad who are engaged in supplying articles for a given market, and all others who are engaged in importing or trading in them, are to be met and contended with in the open field of competition. Add to this that the natural prejudices of consumers are everywhere to be overcome, and especially on an article like blasting and gun powder, where it often happens that parties are wedded to particular brands and names and feel quite disposed to let what they consider well enough alone.

Of the intensity of this struggle none know better than the Trustees and Managers of the California Powder Works.

This company was incorporated in December, eighteen hundred and sixty-one, and proceeded at once to the construction of a tunnel thirteen hundred feet in length through a spur of the mountain, and fluming five thousand feet in length, which was to take the water from its natural bed in the San Lorenzo River and conduct it to their works near the banks of that stream, two and a half miles from Santa Cruz.

These being well under way, a large posse of men were set to work clearing the heavy timber from the ground and making preparations for the erection of the mills, which work went rapidly forward until the completion of the first series of mills and machinery.

The manufacture of powder was commenced in May, eighteen hundred and sixty four, the mills at that time having a working capacity for the production of two hundred and fifty kegs of blasting powder per day, at which rate the mills were steadily run with a single interruption till eighteen hundred and sixty-six, when the growing favor with which their powder was received made it apparent to the Trustees that an enlargement of the mills was necessary to meet the increasing demand for their manufacture.

Several improvements were now made to the machinery for facilitating the manufacture, and a duplicate set of mills were resolved upon. The company immediately took the necessary steps to have these mills erected—the entire machinery for which is of California manufacture, whereas that of the first set of mills was imported from the Atlantic States. The entire series of new mills were erected and completed during the Summer and Fall of eighteen hundred and sixty-six, and brought the manufacturing capacity of the works up to the production of six hundred and forty kegs of powder per day—at which rate they have been constantly run with slight interruptions until the present time. It became necessary to use steam as a motive power for a portion of the new mills; and two steam engines are employed for that purpose—one of forty and the other of one hundred and forty horse power—the steam for which is generated in boilers at a distance of three hundred feet and across on the opposite bank of the San Lorenzo River.

The company's mills extend over an area of nearly two hundred acres, and now consist of two pulverizing mills, two mixing mills, five sets of wheel mills, two press mills, a corning mill, two glaze mills, two drying houses and a packing house. Besides these there is a mill for drying and grinding saltpetre, and the coal and refining establishments of sufficient capacity to supply the works with those articles. In connection with their works also is their keg factory and cooper shop, where all the kegs and cases for packing the powder are made; and this of itself is quite an extensive concern, requiring for its operations the labor of nearly fifty hands in that branch of the work alone, besides the employment it furnishes to parties outside the works to supply stave timber, hoop poles, keg heads, etc. They have also extensive storehouses, both at the mills and at their wharf in Santa Cruz, for storing powder, wood, coal, sulphur, graphite, nitre, and their manufactured powder.

The company was incorporated with a capital of one hundred thousand dollars; it was afterwards increased to two hundred thousand, and subsequently to three hundred thousand dollars, and they have spared no expense in erecting their works so as to make them complete in all their appointments of mills, machinery and equipments, and they will compare favorably with the most approved mills of our own or any other country.

They manufacture all the various kinds of mining, blasting, cannon,

musket, sporting and Government standard powder, and they have adopted the most approved styles of packing, in kegs and canister, to make their powder desirable for the market.

The nitre used at their works is imported by the company direct in ships chartered for that purpose, and landed at Santa Cruz; and the various ramifications of their business extends to all its departments, so that nearly everything is done at first hands, by which means their powder is handed to the consumer at the lowest possible price.

The manufacture of powder on this coast has given a great impetus to the production of sulphur in California, and the stimulus it has received by the patronage of the California Powder Works has been one of the means of placing it on a firm footing.

It has ever been a settled practice of the company to employ in the powder mills none but first-class men, whose habits of sobriety and trustworthiness could be relied upon. This is sound policy, as to these men, in a great degree, is intrusted the constant safety of the entire property.

It was the design of the founders of the California Powder Works to make them complete in all their details, and to introduce a firm and steady system of doing their business which should relieve the consumer of powder from the damaging fluctuations of the market and the grinding extortions of high prices that had existed from time to time, and materially cramping the progress of the mining interests of the whole Pacific coast.

This they have accomplished, and many mines where large quantities of powder are used have been opened and successfully worked that would otherwise have remained unproductive, and thus has the general welfare been increased.

J. W. WILLARD,
For the Company.

STATEMENT OF J. F. FUGAZI.

SACRAMENTO, September, 1867.

To the Committee appointed by the State Board of Agriculture to award Gold Medals:

GENTLEMEN: Being one of the many exhibitors of articles at the late Fair, I hereby submit for your examination a few compounds manufactured by myself, namely: Hair dye, Cologne water, hair restorative, marrow pomade, etc., etc.

By a thorough investigation of the articles in question, which may be seen at my place of business, "K Street Baths," you can determine the merits of these compounds and the benefits that may accrue by their introduction into general use.

I am confident that my hair dye, etc., would, long ere this, be in general use throughout the State were I in possession of the necessary means to advertise, as you are well aware that advertising largely has been the means by which many a worthless article has made a fortune for its inventor, while many a better one has been cast aside for want of capital.

By a little encouragement from you, gentlemen, I may be enabled to bring my compounds into general use. By investigation you may see that I can manufacture a better article than can be obtained from any Eastern or foreign market, and I can sell it considerably cheaper. Each dozen bottles sell for from six to seven dollars, on which there is a revenue tax of forty-eight cents. You see by this, gentlemen, that its manufacture and sale (were it in general use) would be no small source of revenue to the Government.

I submit for your consideration a few properties of my hair restorative: This elegant preparation for the hair is composed of purely vegetable ingredients, and is the result of years of careful research and study and is combined upon the most scientific principles of chemistry. It allays all itching of the scalp, rendering the brashest hair soft and glossy, causing it to grow rich and luxuriant, and is a certain remedy for dandruff, eruptions on the head and dryness of the hair, and prevents the hair falling, requiring but two or three applications. "Warranted not to fail."

The Oriental oil hair dye is mostly composed of vegetable ingredients and contains no injurious substance whatever. In all cases it prevents the hair from falling off, and keeps it soft and glossy. The most remarkable feature of this oil dye is the natural color it produces when applied, changing the grayest hair or whiskers to the most beautiful black or brown in from two to three applications. Persons are not compelled to undergo the disagreeable treatment of washing and scraping the hair or whiskers which is required by using other hair dyes; it is only necessary to shake the bottle and apply the dye carefully with a tooth-brush, lifting the hair with a comb; two applications will color the hair brown, and three a beautiful black, twenty-four hours intervening between each application, and any hair oil or cosmetic can be used after the hair or whiskers are colored without injuring the dye.

PREMIUM.

Premium awarded by the Mechanics' Institute, San Francisco, eighteen hundred and sixty-five:

J. F. Fugazi, who exhibited a very large and fine assortment of his own manufacture. The Cologne water, hair restorative, marrow pomade, hair dye, etc., were of most excellent quality, and in the opinion of the Committee, equal, if not superior, to imported articles. Analysis made by the Committee shows the hair restorative to be of a harmless nature, while the testimony of respective parties who have used the articles bears witness to its good effect.

Awarded a silver medal.

DR. L. LANSZWEERT,
ROYAL FISKE,
Committee.

ANALYSIS.

ASSAY OFFICE LABORATORY,
SAN FRANCISCO, September 13th, 1865.

The result of an analysis made of J. F. Fugazi's hair tonic and hair restorative proves that they contain no deleterious substances, that the ingredients used in the manufacture of these compounds are of vegeta-

ble origin, and their use is not injurious to the hair and are valuable for the purposes intended.

DR. L. LANSZWEERT,
Chemist.

PREMIUMS.

From the San Joaquin Agricultural Society, eighteen hundred and sixty-five:

We recommend a special premium for a fine collection of perfumery and cosmetics manufactured by J. F. Fugazi, in San Francisco.

T. B. CHOATE,
DR. NORCOM,
DR. BROWN,
DR. SCHMIDT,
Committee.

You will also find in the reports of the Mechanics' Institute of the Fair of eighteen hundred and sixty-four that the first premium was awarded to me for the best quality of Cologne. The Committee were: D. S. Cutter, D. Kanary, J. H. C. Portman.

At the State Fairs held in Sacramento in eighteen hundred and sixty-three, eighteen hundred and sixty-five and eighteen hundred and sixty-six, my compounds have received premiums, viz: in eighteen hundred and sixty-three, a diploma; eighteen hundred and sixty-five, a silver cup; eighteen hundred and sixty-six, a silver cup. I have not the reports with me, but they may be found in the Secretary's office.

In conclusion, I would say, gentlemen, if the foregoing recommendations are not sufficient in your judgment to entitle me to receive a gold medal for my invention, the compounds are at all times at your disposal, or at the disposal of any chemist, for analysis.

J. F. FUGAZI.

STATEMENT OF ADOLPH MULLER, FUR DEALER.

SAN FRANCISCO, October 8th, 1867.

To the Committee on Gold Medals:

GENTLEMEN: Having arrived in this country in the year eighteen hundred and sixty-one for the purpose of visiting my customers, I found that there was a good opening for furs, and I then started the first fur business in this State, for which I was duly awarded the first premiums for furs exhibited at the Fairs of eighteen hundred and sixty-three, eighteen hundred and sixty-four, eighteen hundred and sixty-five and eighteen hundred and sixty-seven. I give the above particulars to show reasons why I ask for the gold medal to be awarded to the most meritorious exhibition in the Third Department.

Although it may look impudent to praise one's own goods too high, the furs I exhibited at the last State Fair are equal to any workmanship done in the cities of the Eastern States, owing to my experience in this one line of business since eighteen hundred and forty-four in the cit-

ies of Berlin, Paris and London. By my exhibitions I have shown not only what this State produced in furs, but all new kinds from our newly annexed country, the former Russian Possessions.

All the aforesaid reasons I hope will justify my demand, and should my wish be complied with I would appreciate it higher than the most successful operation in business.

ADOLPH MULLER.

STATEMENT OF HENRY LAKE, OF SAN FRANCISCO, FOR BOOT BLACKING.

To the Committee on award of Gold Medals:

GENTLEMEN: The article which I exhibited at the Fair seems of but little importance compared to many others exhibited in the same department; and while my claim for the medal of the Third Department may not be very good, yet I claim for my exhibition a good degree of merit. The article of blacking which I exhibited, and which I manufacture, combines the requisites of giving the leather a very fine polish and preserves the leather. It retains the most brilliant lustre, and at the same time will not soil the finest linen when rubbed with it. The regular Committee gave me a special premium and recommended it highly for general use.

HENRY LAKE.

FOURTH DEPARTMENT—AGRICULTURAL PRODUCTS.

STATEMENT OF L. PREVOST, OF SAN JOSE, FOR SILK CULTURE.

To the Committee on award of Gold Medals of the State Agricultural Society:

GENTLEMEN: I see by an advertisement in the Union that parties competing for the gold medals are required to furnish the Committee with a written statement of their claim to the same. I have no time to write at present; but suppose I had, it does not seem to me necessary. I have already written the "Silk Growers' Manual," to which I beg leave to refer the Committee. I have given all the information necessary in regard to the business which I represented at the Fair, both by writing and by example in feeding. As to its importance to the best interests of California, there is no other industry, I am satisfied, that can come near it. It is well known that the silk culture and manufacture is already the support of several nations, and that in many respects it is superior to any domestic employment yet discovered. The culture is the reality of free labor to free men, providing healthy occupation, social comforts, refinement and personal independence.

L. PREVOST.

STATEMENT OF ISIDOR LANDSBERGER, OF SAN FRANCISCO, FOR THE WINE INTEREST.

To the Committee on the award of Gold Medals of the State Agricultural Society:

GENTLEMEN: I beg to present to your consideration this, my application, for one of the gold medals to be awarded at your present meeting to exhibitors at the late State Fair. This application I make in behalf of the wine interest, destined one day to be the greatest agricultural interest of the State. This branch I represented at the late Fair with honor, being awarded four first premiums for my wines, and one special premium for their notable superiority. This was the largest number of premiums awarded to any one person exhibiting in my class. It is after this result that I respectfully lay before you my claim to the gold medal, should it be decerned to the wine producing interest—and to this it should be decerned. This mighty resource of our State is still struggling for a bare existence in its cradle; it needs every support and every encouragement; but when once its existence is a conquered fact, it will become a source of untold wealth to California. More than any other pursuit, it will attract emigration to our shores, and will feed and clothe the thousands that flock to us.

The following few lines will show what we have already done in this pursuit, in spite of our want of knowledge and in spite of prejudice:

According to reliable statistics there are now planted in this State twenty million Mission vines, and about two million imported vines. Reduced to acres, we have twenty thousand acres Mission vines, and two thousand acres imported vines. The average value per acre is three hundred dollars for land planted with Mission vines, and six hundred dollars for that planted in imported vines; giving for twenty thousand acres of Mission vines, six million dollars, and for two thousand acres of imported vines, one million two hundred thousand dollars, or a sum of seven million two hundred thousand dollars. To this should be added improvements, such as dwellings, barns, cellars, casks, etc., which at a moderate estimate would be at least half of the above sum, or three million six hundred thousand dollars.

Of the twenty million vines there are probably bearing twelve millions, and many for the first time. These, last year, produced three million gallons of wine, that can be valued at one million of dollars. This sum must go to the rest and brings us to the amount of capital invested in wine growing in California:

Twenty thousand acres, Mission vines	$6,000,000
Two thousand acres, imported vines	1,200,000
Improvements, dwellings, etc	3,600,000
One crop of wine (1866)	1,000,000
Total	$11,800,000

And this, gentlemen, is the toddling infancy of this agricultural pursuit. You only see vines planted here and there. What will it not become under proper encouragement? The steep rugged hills which

now are covered with chaparral will be clothed in the green of vines, and their sides be dotted with prosperous and happy homes.

For this pursuit, gentlemen, I claim the gold medal. Our wines have already found favor with the consumers of the Eastern States, and to Europe I have shipped a number of pipes, which were ordered from there. The more wine we raise the more we will ship, and the greater will be our prosperity. Our wines not only bear shipment, but improve a hundred fold by a sea voyage; it changes them from new to old, mellows them and developes their pure, delicate flavor.

Let me now have your attention to an enterprise connected with that of wine growing, namely, the production of sparkling wine from our pure native wines. Many have, since thirteen years, gone into this branch of wine making, but all have failed. I am the first and only one who has successfully delivered to the market a good, pure wine, sparkling equally as much if not more than the imported French champagnes. And this I have done in a legitimate way, through natural fermentation in the bottle. There are persons who have duped the public by selling to it a vile compound whose gas was generated from oil of vitriol and marble dust and forced in with a soda apparatus; these persons have brought into the worst repute the California sparkling wines. The liquid they make, when new, foams, but never sparkles; and even its foam holds but a couple weeks, and the wine becomes cloudy and dull. These unhealthy liquids never bear shipment, and are a disgrace to the State.

For my sparkling California I claim the acknowledgment of success. I have sent it to England, New York and Japan. From Japan and England I have not yet heard, but it arrived in New York in perfect order, was diamond-bright, and sparkled long and continuously. Its taste was perfect.

At the late Fair, of two premiums given, I received the first, and the same at the San Joaquin Fair.

Though exceedingly hazardous, this branch of wine making is calculated, more than any other, to give a stimulus to our wine interests and encouragement to the growth of superior qualities.

To successfully produce a sparkling wine the wines that are used must be the purest in taste, the richest in flavor and the finest in bouquet. It is owing to the observance of these facts that certain brands of French champagnes have attained their reputation. To secure wines with the above qualities I have paid seventy-five cents per gallon, while I could have obtained ordinary and sound wines for thirty and thirty-five cents. The encouragement I thus give the producer is marked, direct and certainly great.

It is especially to encourage me in this enterprise that I apply to you for a gold medal.

It requires a large capital, the most minute care and immense labor to bring it to a successful end; but, once attained, the wine will be shipped to every part of the globe and establish for California an enviable reputation. One by one, others will engage in the enterprise, and through time and experience also become successful. But I, the pioneer, will have to smoothen the way for those who follow; to me falls the hard task of re-establishing a name made disreputable by the vile liquids that have been palmed upon the public as California champagne. It will be for me to experiment, for me to fight prejudice, the greatest of all obstacles. When all this is accomplished the road will be smooth and many will follow. If to attain this end I am upheld by our prominent men, I

am willing that others shall reap with me what I have sown; but I must be upheld.

The interests of the wine merchant and wine producer are harmonious and relative; much more than is generally supposed. That the wine grower may be prosperous the merchant must be successful. Whatever affects one wine merchant carries its influence, for good or bad, over many producers, for he buys not from one, but from many. It is through the encouragement from the merchant that the producer prospers, and without his help many would have had to abandon their vineyards. Dealers there are who raise their own wine entirely; but any distinction conferred upon them would be only a personal benefit; whereas, the same distinction conferred upon a dealer who buys his wines from many vineyards spreads its influence for good to many producers. To this point I would particularly draw your attention.

There is a very natural consequence arising from a dealer producing his own wine, which is, that the wine he raises he must and does sell, be it better or worse. Not so with him who relies entirely upon his purchases; he has the choice from many vineyards, and only selects such as please him in quality.

I come now and seek at your hands, gentlemen, a little of that encouragement that I have ever given the wine grower. They will all testify that I had no secrets, but sowed my knowledge broadcast among them, and never one left me without the information he sought.

Hoping that you will look favorably upon the reasons I give in applying for a gold medal, I remain respectfully, gentlemen, your obedient servant,

ISIDOR LANDSBERGER.

STATEMENT OF B. N. BUGBEY, OF SACRAMENTO COUNTY, FOR WINES AND BRANDIES.

To the Committee to award the Gold Medals of the State Agricultural Society:

GENTLEMEN: The undersigned, exhibitor of wines and brandies at the Fair in September last, hereby respectfully presents his claim for the gold medal to be awarded in the Fourth Department.

In presenting my claim, I respectfully present for your consideration the following grounds on which said claim is based:

First—The wines exhibited by me were the pure juice of the grape unadulterated. The same is true with the brandy, excepting that a small amount of burned sugar was used to give it the desired color; with this exception, it is the pure distillation from foreign grapes.

Second—I claim that no other exhibitor had so large an assortment of wines, nor wines possessing that high aromatic flavor, delicacy, mellowness and fine bouquet and body so necessary for marketable wines.

Third—That the manufacture of wines and brandies is in its infancy in this State. That from the very favorable character of our soil and climate for this industry we have every reason to believe that if properly encouraged it will at no distant day become one of, if not the leading agricultural interest of California. Especially may this be the case if

manufacturers of wine shall seek for use the best variety of foreign grapes, and shall keep their wines and brandies pure and unadulterated. This, I am convinced, must be done by wine makers as a class, if they would compete in the markets of the world with the best brands of foreign wines and brandies and stop the importation of such articles for the consumption of our people.

Such is the policy I am and have been pursuing, for the credit of the State, as also for the profits of my business. If all other vine growers and wine makers will pursue the same course, California will very soon drive from her markets all imported wines and brandies, and we will retain in our midst and among the industrial classes the millions of dollars that are now annually sent abroad to enrich the foreign trader in these articles.

Fourth—While other exhibitors of extensive assortments of wines are mostly wine makers only, buying either the grapes or the must from the producer, I raise my own grapes in my own vineyard, and make all my own wines and brandies from grapes of my own production—thus representing every department of this valuable industry, and illustrating what may successfully be done by every vineyardist in the State, and showing to what valuable use the millions of acres of land located along our foothills, from the northern to the southern end of our State, may be devoted.

I come, then, asking the award of the medal in the Department of Agricultural Products, as the real and sole producer of the articles exhibited by me; and I claim especial merit from this fact and also from the fact that I am a leader in the utilization of millions of acres of land in our State, valueless for most any other agricultural product, and yet more valuable for vineyards than any other so extensive a region in the world. The experiment, which I have made an eminently successful one may be followed with profit to himself and to the State by any poor, industrious and enterprising man among us, or that may come among us for years in the future. It shows that we have land enough, of the very best quality for wine making, to produce all the wine that can be consumed in the world for a century to come, and to give profitable employment and comfortable homes to the millions of half paid laborers in all the wine producing countries of the old world. They have but to come and occupy and cultivate it, and in a few years they will be more independent and happy than those upon whom they now depend for their daily labor and meagre support for themselves and family.

I conclusion, I ask the Committee to give the foregoing considerations a careful thought, and if they believe my exhibition worthy, to award to it the medal at their disposal.

B. N. BUGBEY.

STATEMENT OF M. S. KING, OF SACRAMENTO, IN FAVOR OF CANNED FRUITS.

To the Committee on award of Gold Medals:

GENTLEMEN: The object of the society in offering a gold medal to one of the most worthy exhibitors in each department is, as I understand it, to give encouragement to such productions and manufactures as will

most advance the interests of the State in those respects. In presenting my claim for the medal offered for the Fourth Division I am unable to make as full and satisfactory a statement as I would like to, for want of proper statistics as to the amount of canned fruits consumed in this State, Nevada and adjoining Territories, or the amount imported from the Eastern States and Europe. But enough is known to warrant the conclusion that there is twice, perhaps five times, as much consumed as there is of home manufacture. Thus we have taken from the State, annually, at least one hundred thousand dollars for fruits which could very easily be canned in our own State. And as this State is so very prolific in fruits, it is very important that there should be some means adopted to save and put in market the surplus which, if not sold in their proper season, will perish. I propose to can all such that are good, and thus give encouragement to the horticultural interest of the State. Small as my business is comparatively, I know that it has had some influence on the price of fruits. Its control over the price of tomatoes this year has been more marked than that on fruits, but the general result is the same. Early this season, before I commenced canning, tomatoes were a drug at fifty cents per one hundred pounds, and in less than two weeks after I commenced they were selling in market at one dollar and fifty cents per one hundred pounds. The result was that I had to stop operating on them until I could buy them plentifully at seventy-five cents per one hundred pounds. Thus prices alternated through the season. And so it is with fruits—in proportion as the supply is to the immediate demand.

As to how well I have succeeded in this branch of manufacture, I hope it will suffice to give a brief history of my experience in this department: In eighteen hundred and sixty-one I commenced the business, more as an experiment than with a fixed purpose to prosecute it. But being well aware that if I would be successful I must have better facilities for making cans than could be obtained in the State, for that purpose I invented and made a machine which I exhibited in the State Fair of that year, and for which I received a framed diploma. Since then I have made improvements and additions to my machinery which enable me to make cans better and cheaper than they can be without such machinery. The first year I put up three thousand cans, and have increased the amount each year until last year, when I had eighteen thousand, and fell far short of having enough to supply the demand. This year I intended putting up thirty thousand cans, but owing to the scarcity of peaches I only got twenty-five thousand filled, which amount will not near supply the market till the next fruit season. Since I commenced the business there has not far from one dozen individuals and companies tried it, but none were able to continue it successfully. By very close attention and untiring perseverance I have established a business and trade which may be increased to any extent proportionate to the amount of fruit raised within marketable distance of this place. Now, without any disparagement to any of the producers or manufacturers enumerated in the Fourth Department, I think there are none more intimately connected with the horticultural and some of the agricultural interests of the State, nor are there any more essential to a full development of those pursuits than thus taking care of their surplus products and adding to their value. Nor are there any that need as much protection against foreign competition, as canned fruits are sometimes shipped here so abundantly as to reduce the price as low as one dollar and forty cents per dozen for tomatoes and three dollars for peaches.

Since the first of April this year (eighteen hundred and sixty-seven) I have worked into cans one hundred and four boxes plate tin, at an average cost of thirteen dollars and fifty cents per box, and seven hundred pounds of solder, at twenty-five cents per pound. I have used since the first of August twenty thousand pounds of peaches, at an average cost of two cents per pound; sixty thousand pounds of tomatoes, at three quarters of a cent per pound; six thousand pounds of gage plums, at two cents per pound; four thousand quinces and pears, at two and one half cents per pound; two thousand blackberries, at twelve and one half cents per pound. When I have a full supply of fruit I work twenty-five hands. This season is the first that I have made any jellies. I have made one hundred dozen, and find very ready sale for them. The demand for my canned fruits this season is much larger than it has ever been, so much so that I am not able to paint, label and case them fast enough to fill my orders. I am now two hundred cases behind my orders.

I have given as full a statement of my business as I well can do, and in consideration of its importance and the progress I have made in establishing the business amidst many difficulties I hope you will conclude to award the medal for the Fourth Department to me.

M. S. KING.

STATEMENT OF D. L. PERKINS, OF ALAMEDA, FOR GARDEN SEEDS.

To the Committee on Gold Medals:

GENTLEMEN: The following claim for the gold medal for agricultural products by me is most respectfully submitted for your consideration:

I claim that I have done more to promote the interest of agriculture than any one person in this State. For the past ten years all my time and attention has been given to the raising of seeds for the benefit of its people, striving to get the best of seeds from all parts of the world, and by so doing to select the best for the gardeners and farmers to cultivate for the market. How well I have succeeded has been shown by the fine display of vegetables that has been seen in our markets and at the various Fairs that have been held in our State. The immense size of our vegetables has called forth from those that have visited us expressions of wonder and surprise through the press—has given to our State a character for agricultural productions that no other State can successfully rival. During the past three years I have at the solicitation of different parties sent to quite a number of the Eastern States collections of seeds to be by them tested, and the enterprise has given such good results of their good size and qualities over the same varieties formerly grown by them that several parties ordered seeds direct from me, thus showing that California can not only furnish the finest cereals but also can compete with the world for garden seeds. During the time that I have been producing seeds for the market scarcely a complaint has been made but that the seeds have proved just as they were represented by the label, true to their name. There is no State in the Union so well adapted to the raising of seeds as California. It is

one of those branches of industry that cannot be tampered with. It is a legitimate branch of itself, and requires great care and attention. This branch of industry does not favor one individual, but thousands are benefited by partaking of good and choice vegetables. During the past five years I have sent of my own accord the products of my labors to the far distant Empire of Japan, China, Sandwich Islands, Mexico and to Europe, the same to be distributed; and the results of the same have been highly favorable, particularly with the Islands, as from this State they can get their seeds in good season and fresher than if they had to send to the Atlantic States, thus giving our State a preference. (Even at the time I am writing this—October—they have planted seeds of this season's growth grown by me.)

During the past two years I have, in order to test the products of this State, interchanged with the Agricultural Department at Washington. A full collection of seeds has been sent by that Department for me to propagate, and I have sent the same back to them, so that they can see the great and good results that have arisen from such a course, and for them to replant the same with those of the same variety grown by them, as an experiment to test the great question of the changing seeds, climate and soils. The yield of the growth of California over the Eastern growth varied from one hundred to three hundred per cent. in favor of California, in size and quantity; thus showing that I have endeavored to promote the great cause of agriculture in this State, and upon this basis I claim the reward of the gold medal at the hands of your Committee.

It is well known that my collection of seeds that I sent to the Paris Exposition received a great deal of attention at the time they were on exhibition. The great size of the samples created much surprise, and being desirous that France should have the benefit of the products of the Golden State I made a donation of the same to the Emperor of France, to have the same fully tested in the Agricultural Department of France, feeling confident on my part that I should be justified in the course I had taken as a citizen of this State.

A still larger collection of seeds will be sent to the Emperor of Russia this Fall, including not only seeds but a full and choice collection of wheat, barley, oats, rye of different varieties, buckwheat, etc. I do this because the Russian Commissioner at Paris was so desirous of getting my collections there.

In view of what I have thus done, upon your kind judgment I rest my claim.

All of which is most respectfully submitted to your consideration.

DANIEL L. PERKINS.

FIFTH DEPARTMENT—HORTICULTURAL PRODUCTS.

STATEMENT OF B. N BUGBEY.

To the Committee on awards of Gold Medals of the State Agricultural Society:

GENTLEMEN: The undersigned, exhibitor of raisins in the Fifth Department of the late State Fair, hereby respectfully presents his claim to the gold medal to be awarded in said department.

I claim the award on the grounds that the production of good merchantable raisins is of more value to the State than any variety or varieties of green or dried fruits or nuts exhibited at the Fair by any other one exhibitor. I furthermore represent that I am the introducer and the pioneer of this branch of industry in this State, or in the United States, so far as I have been able to learn.

The importation of raisins into the State of California during the present year has been equal to thirty thousand whole boxes received direct from Malaga, and fully half that quantity from the Atlantic ports, via the Isthmus and around Cape Horn. The aggregate value of these forty-five thousand boxes, at four dollars per box, foots up one hundred and eighty thousand dollars, paid by the people of this State for imported raisins during the year eighteen hundred and sixty-seven. The growers of raisins in California may not only supply our own market, but they will also have a market in the Atlantic States, where the importations now average about one million two hundred thousand dollars annually. The consumption of this article of dried fruit is increasing rapidly, and the superior soil and climate of California has no competitor in the other portions of the United States for supplying the demand. The undersigned, having been the pioneer in this enterprise of making raisins in California and the United States, has succeeded under adverse circumstances in producing fruit which for flavor, tenderness of pulp, seeds and skin compares favorably with the best Malaga fruit. I have made about two thousand boxes of raisins in all during the past four years, which is the largest quantity made by any one person in the State, and they bore the highest reputation of any in the market.

The method of manufacturing is simple, and as follows: The grapes, when thoroughly ripe, are gathered and spread on tables or on the ground, exposed to the sun for fifteen to twenty days, turning once or twice, when they are packed in boxes for market.

The foregoing claim is respectfully submitted.

B. N. BUGBEY.

STATEMENT OF C. W. REED, OF YOLO COUNTY, FOR WASHINGTON NURSERY.

To the Committee on award of Gold Medals of State Agricultural Society:

GENTLEMEN: Having been an exhibitor at the Fair of the State Agricultural Society—receiving the first premium for the "best twenty varieties of apples" and for the "best twenty varieties of pears," and being therefore entitled to compete for the gold medal offered by the society, under the head of Horticulture—I make the following statement to the Committee appointed to award the medals:

Emigrating to California in January, eighteen hundred and fifty-five, I brought with me twenty thousand fruit trees and about fifteen bushels of tree seed to plant. About ten thousand of the trees were seedlings and ten thousand grafted—including all the most improved varieties then cultivated in the best and most extensive nurseries in the State of New York. The trees I put in in excellent condition, not more than five per cent. failing to grow; my seed were all planted the same season and germinated successfully.

The following year—eighteen hundred and fifty-six—I imported about eighty thousand trees, mostly grafted, and twenty-five bushels of seed. I then commenced planting an extensive orchard of the best varieties of fruit for market; also, an orchard of specimen varieties to enable me, as soon as possible, to propagate entirely from bearing trees.

It has been the misfortune of nurserymen in California to disseminate many trees incorrectly named in early times, and we still see the effect of it in fruits on exhibition at Fairs and in the market. The evil, to a great extent, has been unavoidable in consequence of having had to rely on nursery trees for buds and scions.

Eastern nurserymen are not always infallible—are liable to mistakes. Varieties may get mixed in digging and packing—in being unpacked and transplanted. The effect of a mistake in any leading variety is almost interminable. A nurseryman is always blamed for any mistake in names whether it occurred with him or not. To avoid mistakes, I not only cut all my buds and scions myself, but endeavor to cut all of them from bearing trees. I have often traveled over a hundred miles to obtain buds and scions from bearing trees of varieties I wanted and knew to be correct.

I continued to import nursery stock that could not be propagated with certainty here and seeds; also all new varieties brought to notice. From eighteen hundred and fifty-six to eighteen hundred and sixty-one—five years—my sales of nursery trees averaged from one hundred thousand to one hundred and fifty thousand dollars annually, and I had increased my orchard to six thousand five hundred trees, and my nursery to two hundred thousand trees and plants. I could have done much more during this time, but that I had to clear and fertilize every acre of land from the wildest possible condition before it could be used for the cultivation of either nursery or orchard.

The demand for trees had always been greater than I could supply.

In the Winter of eighteen hundred and sixty-one and eighteen hundred and sixty-two came the disastrous flood, memorable in the history of California, sweeping away and destroying the accumulations of years of industry. My own losses exceeded one hundred thousand nursery

trees, besides a large amount of nursery stock in seed beds, shrubbery, and over four thousand orchard trees. I also lost a plantation of twenty thousand cranberry and five thousand blackberry plants by being buried with sand.

Very little could be done that season, and in eighteen hundred and sixty-three I had to commence almost anew, having lost two thirds of my orchard and my nursery stock being badly broken; but by importing and purchasing from eligible nurseries I was enabled to fill most of my orders for trees and replanted the greater part of my orchard.

In eighteen hundred and sixty-four I had a larger stock of trees than ever before, my sales amounting to about two hundred and fifty thousand and planting about as many in nursery; also adding two thousand trees to my orchard. I had received the first premium from the State Agricultural Society for the best nursery in the State. At this time I had in my nursery four hundred and thirty-six varieties of fruit, being nearly all that were cultivated in the State, particularly of apples and pears.

My object in cultivating so many varieties was not to disseminate them all to any great extent, but to prove them and only propagate varieties best adapted to the soil and climate of California. Still I have always found it necessary to propagate more varieties in California than are cultivated in any other State, from the fact that our population is made up from every section of the country. Varieties were in demand from all parts of the United States without regard to their adaptability to California; but now, through the efforts of enterprising cultivators and the advantages afforded by the State Agricultural Society's Fairs, a knowledge of the leading and meritorious varieties adapted to our soil and climate have become generally known, and the best and most desirable varieties for general cultivation are reduced to comparatively few in number.

I have fruited as many as twenty varieties of apples and several pears the present season that may be considered entirely worthless.

During the years eighteen hundred and sixty-five, eighteen hundred and sixty-six and eighteen hundred and sixty-seven I propagated over one hundred thousand trees annually, and at the present time have about one hundred and fifty thousand trees in nursery, and in my orchard have five thousand five hundred pear trees, over five thousand peach, three thousand apple, one thousand plum, six hundred cherry, five hundred apricot, one hundred nectarine, two hundred quince, one hundred fig, fifty almond, and seven thousand grapevines in vineyard of raisin and table varieties.

I shall increase my orchard to about thirty thousand trees and vines and plant over one million trees in nursery the present season.

Probably there is no other country possessing natural advantages for horticulture equal to those of California; her soil and climate are unequalled for the production of luxuriant vegetation. Combining the advantages of a temperate and tropical climate, a greater variety of fruit is here grown to perfection than perhaps in any other part of the world. The horticultural developments of California are not only the pride of the country but have given every class of society an abundance of the greatest and most healthful of luxuries. There is perhaps no interest possessing more general attraction or that has added more to the prosperity of the State than her horticultural enterprises.

The skill and industry of cultivators combined with her natural resources have enabled California to surpass every other State in the quality, abundance and cheapness of nearly all varieties of fruit cultivated in a temperate climate.

C. W. REED.

SIXTH DEPARTMENT—FINE ARTS.

STATEMENT OF MRS. MARY A. HALL, OF CALAVERAS COUNTY, FOR CRAYON DRAWINGS FROM NATURE AND A POEM.

To the Committee on award of Gold Medals of the State Agricultural Society:

GENTLEMEN: In the particular branch of fine arts in which I exhibited I had no competitor. The question with the Committee must therefore be as to the comparative merits of the particular branches on exhibition, and the peculiar excellence or merit of each. One of the greatest masters in modern art declared drawing to be the first, best and only preparation for painting. Drawing cannot therefore be in itself an inferior art, and a first-class drawing must be superior to a second-class painting. By first-class drawing I mean one that is taken from nature and is truthful in representation and skillful in execution. By second-class painting I mean a picture copied either wholly or in part from the work of another artist, from photographs, or untruthful or faulty in manipulation.

Photography primarily and more properly belongs to mechanics, and has only been elevated to the dignity of a fine art through the skillful retouching by the hand of the artist.

The best picture is a truthful and pleasing copy of nature, as seen by the eye and skillfully executed by the hand, without the assistance of machinery. This, and this alone, constitutes true art in this branch of the fine arts. Beyond a few technicalities in the commencement, there is nothing in the pursuit and development of true art that can be communicated. An artist can no more be invaded in what he originates than a man appropriate the personalities of another. The difference between art and mechanics is simply this: that while art can be learned it can never be taught; but skill in mechanics can be communicated or imparted by experts in their respective branches. Though art is the perfection and sublimation of labor, it is no less the flower and fruit of an inborn love and appreciation of the beautiful implanted by the Creator—that spark of nature's fire inspiring and directing every effort, so that in proportion as genius is of a high or low order, and is sustained by the appliances of civilization, will be the excellence of its fruit.

Neither can art be localized, for everywhere is the artist's field, everywhere the artist's home. But perhaps this should be affirmed with a

qualification. We should rather say, the field of art is where it is sustained, the home of genius where it is appreciated. In fact, to appreciate is in some degree to possess it. The songs, pictures and statues of a people are the unmistakable outcroppings of their moral and intellectual status.

The question is not what songs, pictures or statues artists are able to produce, but what songs are re-echoed by the voice; what pictures or statues are recognized as true representations by the hearts of the people.

It would seem that there is a reflective power in art on a people, and vice versa. It follows that there are mutual responsibilities and mutual duties to be performed in order to advance the good of both and elevate the standard of what was doubtless intended to embellish every walk of civilized life.

While the artist should pursue the theme, portray the picture or realize the statue that addresses itself to the noblest sentiment of humanity, the liberal munificence, the generous sustaining, the cordial recognition and appreciation of those for whose best good the true artist labors should be accorded, that he have no temptation to degrade or prostitute his powers by employing them on ignoble or unworthy subjects. The pencil as employed to illustrate the correct literature of the day is too much infected with what is termed slang, in language, and the tendency of some if not all of our most esteemed periodicals is, in this matter, to vitiate the public taste..

This idea may perhaps be better illustrated by comparing them with some foreign publications of a similar character; for example, the London Illustrated News, whose exquisite published delineations of natural and cultivated scenery and copies of art make our most popular newspaper pictures appear as the merest trash.

Said an eminently successful man of this State, "Success means money." It means this and far more to those who are, as it were, the appointed monitors and interpreters of the age in which they live.

In the self-denials and privations, the arduous labors and tedious waitings involved in and attending a life devoted to art, no award is so sweet as the conviction that one has not labored in vain, but that one's best efforts are appreciated by our peers, the people and the great Master of ceremonies.

With reference to the poem I had the honor to read before your valuable society, I will only say, if the Committee find it to be a truthful exposition of facts, in faultless measure and agreeable rhyme, the moral of it calculated to advance the interests for the encouragement of which your society was instituted, and if the Committee find it a creditable answer to their call for an essay on the resources of California and the means for their development, they will doubtless award me a recognition in proportion to its merit.

Should I be so fortunate as to obtain the gold medal for the Sixth Department, it will be most thankfully received and will stimulate me to renewed exertions to merit the approbation of all true lovers of art.

MARY A. HALL.

STATEMENT OF JOHN A. TODD FOR PHOTOGRAPHS.

SACRAMENTO, September 25th, 1867.

To the Committee on awarding the Gold Medal of the State Agricultural Society:

GENTLEMEN: In accordance with your request, as appears by advertisement in the Sacramento Daily Union, that parties wishing to compete for the gold medal prize offered by the society as a reward for works of merit exhibited should present a statement in writing in reference to the same, I beg most respectfully to say:

The photographs exhibited by myself, though not as numerous in variety, exceeded that of any others, comprising nearly every specimen known to the art Plain life-size photographs, just as they were produced by the camera, showing no trace of deposit on the deepest shadows, and at the same time presenting remarkable clearness in the most prominent parts of the figure.

Those in colors—for truthfulness to nature, softness and harmony of effect—constituting portraits of the subject in every sense of the word; and those retouched with India ink, to soften the general hardness of outline and deepen the shadows, whereby the whole figure is brought into true relief, at the same time adding animation to the expression and presenting a likeness of the several individuals that is not to be mistaken.

For the landscape photographs I exhibited, more particularly do I claim a pre-eminent position for clearness in detail, various depths of shade and shadow, correct proportion in perspective and in distance, showing remarkably plain mountains one hundred miles away.

All the photographs I exhibited, both plain and retouched, are my own individual production, having received no assistance from any source whatever, and my entire display—twenty-three pictures—was never before exhibited.

In addition, I wish to call the attention of the Committee to the circumstance that in all countries—Europe as well as the United States—it is customary with photographers to object (in consequence of their inability to produce, photographically, white, blue and other highly reflective colors) to sit persons for portraits unless they were purposely attired for the occasion. Nevertheless, I have presented to the kind observation of all, photographs in great variety of costume, color, etc.; such, indeed, as is daily worn in the City of Sacramento in the hottest season of the year. Negatives of several of the large photographs I exhibited were obtained when the thermometer stood at one hundred degrees Fahrenheit in the glass room; and every solution I had in use was equally warm, as I used no artificial means to keep them cool.

All of which is most respectfully submitted.

JOHN A. TODD.

STATEMENT OF WILLIAM SHEW, FOR PHOTOGRAPHS.

San Francisco, October 15th, 1867.

To the Committee on award of Gold Medals of the State Agricultural Society:

Gentlemen: Absence from the city has prevented me from compiling any statistics relative to my exhibition at the late State Fair. It would be a work of months to accumulate statistics in the photographic business that would be of use for publication by the Committee who are to award the gold medals. Our business has risen from the small daguerreotype to its present condition, where works of art are produced with the camera obscura and the pencil of our artist that have never been equalled. Some of these were in our collection at the late State Fair.

As a contestant for the gold medal, I claim it on the ground, particularly, for photographic painting. A photograph in itself is as near perfection as mechanical skill can produce, and can justly be ranked amongst works of art. It hardly admits of any doubt that only talent and a thorough education in fine arts can attempt to improve a photograph. The real merit of photograph painting consists in (and I claim as a superiority over others) the rendering of a photograph not as simply given by the operator through the camera, but as an entirely changed picture, representing a water color painting with all the transparent tints of life, and perfect modelling—changing the expression to any one desired, without losing the likeness. The same that can be said of any good painting must be admitted in a well painted photograph, with the advantage of the delineations of the camera for an outline. Professor Kock, the artist employed in my establishment, is well known in all our Eastern cities, and since he has been in California has given sufficient proof of his abilities in oil painting. It is his work on our excellent photographs on which we base our claim for that gold medal to be awarded to the Fine Arts Department, and I think I can with confidence submit my claim to your Committee.

Respectfully, yours,

WILLIAM SHEW.

STATEMENT OF NORTON BUSH, FOR PAINTINGS.

San Francisco, October 12th, 1867.

To the Committee on awarding Gold Medals of the State Agricultural Society:

Gentlemen: Notice having been given that those claiming prizes must do so prior to the seventeenth instant, and give reasons for the same, I beg leave respectfully to claim the medal awarded to the Department of Fine Arts, on the grounds:

First—That I produced the best painting, for which I received the first premium.

Second—I exhibited the best painting of California scenery, for which I was awarded the first premium.

Third—I had the best collection of paintings, for which I likewise received the first premium.

On these grounds I base my claim, and submit the case to the judgment of the Committee.

Respectfully yours, NORTON BUSH.

STATEMENT OF A. B. BOWERS, FOR A MAP OF SONOMA COUNTY.

PETALUMA, October 22d, 1867.

To the Committee on award of Gold Medal of the State Agricultural Society:

GENTLEMEN: I am informed that the State Agricultural Society purpose awarding a gold medal to the most meritorious article on exhibition at the late State Fair, in each of the six departments.

Classed among the fine arts was a map of Sonoma County, to which was awarded a diploma. The first edition of this map cost the author thirteen thousand five hundred dollars in cash and over five years labor, and he is now publishing a new edition, which, with the additions and corrections, will cost seven thousand five hundred dollars, or twenty-five hundred dollars over the estimate.

A copy of the second edition can be seen at the office of the Sacramento Union. It is highly complimented by all who have seen it, and is believed to be the best county map ever published in America. It was made and published entirely at the expense of the author, and entails upon him a loss of about fifteen thousand dollars. He expected, at first, that the cash outlay would come back to him, but soon discovered that the income from the map would fall far short of the cash expenditures, but for reasons which can be inferred from the accompanying pamphlet, he prosecuted the work to its completion, regardless of the loss incurred by so doing. He sends with this, in pamphlet form, a history of the whole matter.

It is believed that a work of so much value, prosecuted under great disadvantages for thirteen years, the greater portion of which was devoted to the making of money to be applied to the completion and publication of the map or to labor on the map itself, must be considered as more meritorious, by far, than any merely ornamental article, however artistic. The author hopes that the society will accord to his work that consideration to which those familiar with the county and the map think it fairly entitled, and which would be to him a source of life-long satisfaction.

A. B. BOWERS.

STATEMENT OF L. K. HAMMER, FOR MUSICAL INSTRUMENTS.

SACRAMENTO, October 20th, 1867.

To the Committee on award of Gold Medals of the State Agricultural Society:

GENTLEMEN: I am a competitor for the gold medal to be awarded to the most meritorious exhibition in the Department of Fine Arts at the

late State Fair, and therefore make the following statement: The exhibition which I had the honor to make consisted of the following musical instruments, viz: Chickering's grand piano, Chickering's square piano, Mason & Hamlin's large organ, one melodeon, one set brass instruments, a clarionet, a violin—all of which were awarded first or special premiums, amounting in the aggregate to eighty-five dollars. My principal competitors for the medals exhibited paintings, drawings, photograps, marble works and essays. The decision of the Committee will therefore involve a discussion as to the relative general merits of these several branches of the fine arts; and then, having come to a conclusion upon this question, the next may be as to which competitor most creditably represented the particular branch of the fine arts in which he was an exhibitor. To decide the former of these propositions, it seems to me, needs but a moment's reflection. The faculty for music is one of the noblest faculties of the human mind. This faculty well cultivated tends to bring into exercise the noblest faculties of an individual and renders him more happy and contented, and puts him on better and more sociable terms with those into whose company circumstances may place him. As with an individual so with all mankind. Hence, in the education of our youth, all enlightened educators recommend that music be by no means omitted, and in all our most approved systems of education and schools, music, both vocal and instrumental, is as regularly taught and required now as the arts of reading and writing, and, like these arts, it is taught to all classes of students. As a fine art, music holds no inferior position, but, by the great masters, has generally been conceded to rank first. In the production of instrumental music, recourse is had to the highest and noblest attributes of pure art, as well as to the highest and most perfect execution of mechanical art. Indeed, the faculty of music may well be classed, as it really is, among the highest and most godlike faculties of the human soul, and is most appropriately brought into requisition by all nations in the worship and praise of their God. Whatever may be the peculiar belief of the different classes of heathens as to the attributes of the gods they worship, or whatever distinctions the different Christian denominations may have adopted in their views of a Supreme Being or of the most acceptable mode of worshipping Him, all agree that music in some form is acceptable and efficacious.

The stars are said to have "sang together in the heavens," and in this they gave positive evidence of the completion, accord and harmony of the great works of the Creator when fresh from His hands. The "music of the universe" is the highest evidence of the infinite wisdom of the Creator, and so music created by man is most indicative of his high and divine origin and destiny. Enough has been said to place music where it properly belongs—in the front rank of the fine arts—and it only remains to show that my exhibition in this particular branch thereof was meritorious. Most prominent among the many musical instruments presented by me were two first-class Chickering pianos. In exhibiting these celebrated pianos I acted as the agent of the manufacturers, and therefore it is proper that the Committee should give to the exhibition the same consideration and the same place as to merit as if it had been made by the Chickerings themselves. In this view it becomes me to speak and the Committee to consider some of the facts connected with their invention and manufacture.

Chickering is the inventor of the iron frame used in all pianos at the present day, for which he was awarded a first-class medal at the World's Fair at London in eighteen hundred and fifty-three, and some sixty med-

als from various State and National Fairs since that time. He also received a gold medal awarded by the jury at the Universal Exposition at Paris in eighteen hundred and sixty-seven, to which the Emperor added as a mark of his especial and personal approval the high distinction of the Legion of Honor. Mr. Chickering is also the inventor of the circular scale now so generally used.

The factory for the manufactory of Chickering's pianos was established in eighteen hundred and twenty-three, and is the oldest piano factory in America. It is strictly and wholly an American institution, and as such has contributed more—and I say it without fear of contradiction—to the formation and cultivation of a correct taste for music in the United States and in California than any other similar establishment in the world. It gives constant and remunerative employment to three hundred and fifty-seven persons, and makes from two thousand five hundred to three thousand pianos annually.

In addition to an exhibition of the instruments themselves, the undersigned, at great expense, procured the attendance of the best musical talent in the State, and at intervals during the continuance of the Fair entertained the audience with music equal to the best that has ever been presented at the first musical entertainments of the world.

In consideration of these facts the undersigned asks the award of the gold medal for the Sixth Department.

L. K. HAMMER.

STATEMENT OF AITKEN & CO., FOR MARBLE WORKS.

SACRAMENTO, November 1st, 1867.

To the Committee on awards of Gold Medals by the State Agricultural Society:

GENTLEMEN: We, the undersigned, claim that we are entitled to the award of the gold medal for the most meritorious exhibition in the Department of Fine Arts.

First—Because we had the best exhibit of statuary (the highest class of fine arts) produced from California marble.

Second—Because we have labored almost exclusively for the last eleven years to develope California products, and have finally succeeded in producing a quality of marble that has no superior in this country or Europe, it being more free from flint or iron, finer and more compact, stronger and capable of more "relief" than either Italian or Vermont.

Third—By such development we will in time save more money to California than any other branch of fine arts.

Fourth—That in bringing about this result we have been unaided by any except our own labor and the acknowledged worth of the material produced, and we have thus far overcome all discouragements naturally attendant on all new enterprises in new countries.

Fifth—We are supplying not only our own State but Oregon with marble, and we hope to extend the demand for California marble until the whole Pacific Coast and "islands of the sea" shall pay tribute to the general wealth of our State, besides giving employment to hundreds of our own people.

The importance of the development of our marble quarries can scarcely be realized, except by persons who have paid some attention to this particular branch of industry. The development of quarries of equal quality within the same distance from New York that these are from San Francisco would add millions to the real wealth of that State, and it only requires time to produce the same results here.

We have this Spring and Summer erected a mill in place of the one burned down last year, with four gangs of saws, which we are running to their full capacity night and day, producing about forty tons per month, with capacity of increasing to almost any extent as the demand increases.

Hoping to receive a favorable consideration, we submit the matter to your decision.

Respectfully,

AITKEN & CO.

STATEMENT OF J. C. DEVINE & BROTHER, FOR MARBLE WORKS.

SACRAMENTO, October 29th, 1867.

To the Committee on award of Gold Medals of the State Agricultural Society:

GENTLEMEN: We claim the gold medal to be awarded in the Sixth Department for our exhibition of marble works, for the following reasons:

First—We had the best and finest collection of marble works on exhibition—so decided by a Committee of competent architects and artisans, who awarded us the first premium offered by the society for such works.

Second—We claim that our exhibition comprised the finest and most elaborate workmanship ever executed on the Pacific coast; and in this position we are sustained by many good judges.

Third—For mechanical skill and art combined in the most modern and approved design, and most perfect proportion of every piece, exhibited by us.

Fourth—For the beautiful figure-head sculpture, in our native Vermont marble, as fine in every particular as the best Italian statuary marble.

Fifth—We claim the medal for the reason that we went to great expense to obtain the material to make the exhibition and in extra labor upon it, that the exhibition in our department of industry might be creditably represented at the Fair of the society.

All of which is most respectfully submitted.

J. C. DEVINE & BROTHER.

STATEMENT OF WILLIAM M. HAYNIE, FOR ESSAYS ON SILK AND HOP CULTURE.

SACRAMENTO, October 30th, 1867.

To the Committee on Gold Medals of the State Agricultural Society:

GENTLEMEN: Being desirous of competing for the gold medal offered by the society in the Sixth Department under the head of Fine Arts, I herewith submit for the consideration of the Committee appointed to make the awards the following propositions, upon which I base my claim:

ESSAY ON HOP CULTURE.

It will be readily admitted by all practical minds that to bring any great branch of industry prominently and successfully before the minds of the people of this State, as well as those of the Atlantic States and Europe, we must furnish them with correct practical knowledge pertaining to those industries, as adapted to the soil and climate of California.

If it is true that knowledge is power when applied to the arts and sciences, it is most pre-eminently so when applied to the successful development of the different branches of agriculture in this State. To originate this knowledge in this great State we must plant and experiment from year to year, noticing the errors and mistakes made this year and guard against them the next, until finally we shall have arranged our system of cultivation and management until we obtain the best possible results. Then, if we wish to benefit our race, and see our noble State speedily and surely moving forward to take her place at the head of the great sisterhood of States composing our glorious and common country, we will be willing to communicate our knowledge in such a way that not only the people of this State but the people of the Atlantic States and Europe will see the advantage that will accrue to them by emigrating to this most highly-favored land.

I beg leave to refer the Committee to my essay on hop culture read at the Fair, and note if it will not bear me out in the following propositions:

First—That I have shown in a clear and practical manner the great advantage of hop growing in California.

Second—That parties wishing to embark in the business can do so with a reasonable prospect of pecuniary success.

Third—That it is clearly demonstrated by practical results in hop growing that a very large quantity of land lying along the rivers of the interior is most admirably adapted to the successful cultivation of the hop, thereby increasing the value of those lands very materially.

Fourth—Having made public the results of my labor and experience, so that a powerful inducement is offered to parties to emigrate from Europe and the Atlantic States to engage in hop culture as one of the important agricultural staples of the State.

Fifth—Having demonstrated the great advantage of hop culture, thereby securing it the prominence it deserves among our agricultural population and in turn incite our brewers to compete with those of Great Britain and Germany in exporting, with profit, ale and porter to the vast

markets that exist in foreign countries bordering on the Pacific and also in the China Sea, and which, from their geographical position, should be supplied with malt liquor from this State.

Sixth—That in hop growing a new field of labor is opened for the profitable employment of Chinese labor, where they may not come in contact with unskilled white labor.

Seventh—That the planting, cultivation, picking and curing is clearly and practically explained in detail, so that any one of ordinary ability may engage in the business without fear of failure, and that a great incentive is given to our people to plant hops on land that is now almost useless.

ESSAY ON SILK CULTURE.

The above arguments apply with equal force to Essay on Silk Culture, with the exception of the fifth proposition.

The producing and manufacturing of silk, we believe, will soon take a prominent position with other industries in this State, for the following reasons:

First—The rapidity with which the feed can be grown.

Second—The small quantity of good mulberry land that it requires to raise feed for a large quantity of worms.

Third—The great abundance of these lands along our rivers in the interior of the State, most of which is entirely useless, unless planted with mulberry for silk culture.

Fourth—That the indoor labor for producing silk is of a very light and pleasant character, well suited for the women and children of the family, making all producers as well as consumers.

Fifth—That the reeling of the silk can be done during our rainy season, and at a time when little else is done on the farm.

Sixth—That the silk produced in California will rank as number one with silk raised in any other portion of the world.

Seventh—That the producing and manufacturing of silk can be combined in this State to the greatest possible advantage.

Eighth—That it will, if largely engaged in, not only stop the drain of precious metals that now go to pay for imported silks, but will furnish profitable articles for export, either as raw or manufactured silks, or as cocoons or silkworm eggs, to foreign countries, and thereby do its part to preserve the equilibrium of monetary exchanges which now are largely against us.

Ninth—That the vast markets now existing in France, Italy and other European silk countries for silkworm eggs, offers large inducements to us to make an effort to obtain their orders to fill, instead of allowing them to pass through our State to China and Japan, as they are now doing.

Tenth—That there is no possibility of overdoing the business by surplus of supply beyond the demand.

Eleventh—That we have yet to hear the word failure apply to any branch of industry in California when the people have determined that it should succeed.

I therefore, in view of what I conceive to be the most worthy and meritorious exhibition in the Sixth Department, most respectfully claim the gold medal for my essays on hop and silk culture, as adapted to the soil and climate of California.

W. M. HAYNIE.

REPORT OF COMMITTEE ON GOLD MEDALS.

SACRAMENTO, December, 1867.

To the President and Board of Directors of the State Agricultural Society, Sacramento, California:

GENTLEMEN: The undersigned, appointed as Commitee to award gold medals to the most meritorious and valuable displays made in the different departments of the State Fair held in September, eighteen hundred and sixty-seven, in Sacramento City, would respectfully report as follows:

The Committee met, pursuant to notice, on the seventeenth of September, all the members being present. On examination of the exhibitions in the different parts of the Fair, it was found impracticable to make immediate decisions on the merits of the articles exhibited. With a view to elicit information, the Committee adjourned to meet on the seventeenth of October, first giving notice of their intention and calling on exhibitors to make written statements of the value of their claims and statistical data of the importance of the articles exhibited. This notice was duly published by your Secretary, I. N. Hoag, Esq., in the Sacramento Union and other papers, and subsequently a postponement of the meeting of the Committee to the first of November was made, to admit of further time being given to exhibitors to file statements of claims.

On the first of November your Committee met again, all the members being present. The entire day was given to the reading of communications and judging the claims made by the various parties contesting for the medals. After thorough examination and deliberation, your Committee made awards, which they would report as follows:

FIRST DEPARTMENT.

In this class there were four contestants, viz:

J. D. Patterson, Alameda County, for Spanish and French Merino sheep, for which he had been awarded eight first premiums.

Thomas Cotter, Sacramento County, for Spanish Merino sheep, for which he had been awarded three first premiums.

Seneca Daniels, Sonoma County, for blood and graded cattle, for which he had been awarded six first premiums.

Joseph Gillis, Yolo County, for swine, for which he had been awarded a first premium.

Of the above classes of animals the Committee decided on giving the medal to sheep, on the ground that they were equally valuable, and that the wool growing interest at the present time was more in need of encouragement than any other in the First Department. On canvassing

the claims of the contestants for sheep, the Committee awarded the medal to J. D. Patterson.

SECOND DEPARTMENT.

In this class there were six contestants, viz:

Baker & Hamilton, Sacramento, for agricultural implements, of which they exhibited a very full and valuable assortment, for which they had been awarded seventeen first premiums and one honorable mention.

Howland, Angell & King, San Francisco, for Hicks' steam engine and iron castings, all made by themselves at the Miners' Foundry, for which they had been awarded two first premiums.

William D. Hooker, San Francisco, for one steam and six Excelsior force pumps, for which had been awarded one first premium and one honorable mention.

Redstone Brothers, for portable drag sawing machine, model of steam engine and shingle machine or cutter, which had been awarded two first premiums.

Pacific Saw Manufacturing Company, San Francisco, for circular and other saws, and reaping and mowing sections, which had been awarded two first premiums.

Thomas Hansbrow, Sacramento, for ship, mining, horse, well and other pumps, hydrostatic model engine and amalgamating pan, which had been awarded four first premiums.

Your Committee were divided in opinion as to the respective merits of the exhibitions of Thomas Hansbrow and Howland, Angell & King. As both were very valuable your Committee finally made award as follows: Gold medal of the department to Thomas Hansbrow for general exhibit; and as there was an extra gold medal belonging to the Society, recommend that it be given to Messrs. Howland, Angell & King for the Hicks engine manufactured by them.

THIRD DEPARTMENT.

In this class there were twenty-two contestants, viz:

Mission Woollen Mills, San Francisco, for exhibition of all varieties of blankets, flannels, buggy robes, cassimeres, cloths, cloakings and shirts and drawers, which had been awarded five first premiums.

Pioneer Woollen Mills, San Francisco, for exhibition of all varieties of blankets, flannels, cassimeres, tweeds, shirts and drawers and ready-made clothing, which had been awarded two first premiums.

Pacific Woolen Mills, San Francisco, for exhibition of full assortment of knit men's shirts and drawers, men's, women's and children's hose, and woollen yarn, which, as a collection, had been awarded a special first premium.

John D. Boyd, San Francisco, for superb exhibition of capabilities of California laurel as a cabinet wood, which had been awarded a first premium.

Buckingham & Hecht, San Francisco, for exhibition of California made boots and shoes, which had been awarded a first premium.

M. M. Cook & Son, San Francisco, for exhibition of fire hose, belting, horse collars and fire engine apparatus—all of California leather and manufacture, which had been awarded a first premium.

California Powder Works, Santa Cruz, for exhibition of all kinds of powder made by them, which had been awarded a special premium.

Martin L. Haas, San Francisco, for exhibition of "Pearl" shirts in washed and unwashed state, which had been awarded a special premium.

Pacific Tannery and Boot and Shoe Company, San Francisco, for exhibition of all varieties of boots and shoes for men's, women's and children's wear, also all kinds of leather used in the manufacture of same tanned by the company, which had been awarded one first and two special premiums.

San Francisco Glass Works, for exhibition of assortment of white and green glassware, Newman's patent self-sealing jar and patent glass smelting pot, which had been awarded twelve first premiums.

Joseph Neumann, San José, for exhibition of raw, floss and manufactured silk, and silk weavers' tools, which had been awarded three first premiums.

Samuel P. Taylor, San Francisco, for white and colored printing, Manila wrapping and medicated paper of California manufacture, which had been awarded a first premium.

Crane & Brigham, San Francisco, for display of sulphate of copper manufactured by them and which had been awarded a first premium.

Oakland Cotton Manufacturing Company, for cotton goods and mixed tweeds, which had been awarded a first premium.

Henry Lake, San Francisco, for Japan paste blacking, which had been awarded a first premium.

Adolph Muller, San Francisco, for dressed and undressed furs and skins, which had been awarded a first premium.

J. F. Fugazi, Sacramento, for hair dyes, pomades and perfumes, which had been awarded a first premium.

John Bray, San Francisco, for all kinds of California tanned leather, skins and shoemakers' tools and findings, which had been awarded two first premiums.

San Francisco and Pacific Lead and Shot Works, for all kinds of sheet, bar and lead pipe and shot, which had been awarded a first premium.

Pacific Oil and Lead Works, San Francisco, for raw and boiled linseed oil and oilcake meal, and paint, which had been awarded a first premium.

Thomas Donnelly, San Francisco, for yeast powders, cream tarter, bicarbonate soda, etc., which had been awarded a first premium.

San Francisco Brush Factory, for assortment of all kinds of California made brushes, which had been awarded a first premium.

Your Committee, after considering the claims presented, awarded the gold medal of this department to the Pacific Woollen Mills for their exhibition of knit goods, a new and valuable manufacture in the State.

FOURTH DEPARTMENT.

In this class there were eight contestants, namely:

Daniel L. Perkins, Oakland, for one hundred and twenty-five varieties of California-grown vegetable seeds, which had been awarded a first premium.

B. N. Bugbey, Folsom, for twenty-five different kinds of wine, made from twenty-one varieties of grapes, and one sample of brandy, made in

El Dorado County, which had been awarded four first and three special premiums.

L. Lacour & Co., San Francisco, for Sarsapariphere Bitters, which had been awarded a special premium.

Isidor Landsberger, San Francisco, for five kinds of still, one kind of sparkling wine, and one sample of brandy, all made from native grapes, which were awarded four first and one special premium.

M. S. King, Sacramento, for canned fruits, jellies and preserves put up for wholesale trade, which had been awarded three first premiums.

L. Prevost, San José, for silk culture in all stages up to the manufacture of silk, which had been awarded a first premium.

S. Marks, San Francisco, for California pale ale and porter, which had been awarded two special premiums.

J. S. Harbison, Sacramento, for Italian and common bees, honey, wax, etc.

Your Committee awarded the gold medal in this department to Louis Prevost, for silk culture.

FIFTH DEPARTMENT.

In this class there were two contestants, viz:

B. N. Bugbey, Folsom, for California raisins, which had been awarded two first premiums.

C. W. Reed, Yolo County, for green fruits, which had been awarded two first premiums.

Your Committee awarded the gold medal in this department to B. N. Bugbey, for raisins.

SIXTH DEPARTMENT.

In this class there were ten contestants, viz:

William Shew, San Francisco, for all varieties of photographs, which had been awarded four first premiums.

Norton Bush, San Francisco, for oil paintings, which had been awarded two first premiums.

H. B Bowers, Sonoma County, for map of Sonoma County, which had been awarded a special premium.

John A. Todd, Sacramento, for photographs, which had been awarded a first premium.

Mrs. M. A. Hall, Calaveras County, for India ink drawings.

J. C. Devine & Bro., Sacramento, for marble work and sculpture, which had been awarded two first premiums.

Aitken & Co., Sacramento, for marble work (California stone), which had been awarded one first and one special premium.

L. K. Hammer, Sacramento, for pianos, organs and other musical instruments, which had been awarded seven first premiums and two "honorable mentions."

Silas Selleck, San Francisco, for plain and cabinet photographs, which had been awarded one first and one special premium.

William M. Haynie, Sacramento, for essays on hop and silk culture, which had been awarded two first premiums.

Your Committee awarded the gold medal in this department to Norton Bush, for oil paintings.

In concluding the report your Committee would state that they experienced considerable difficulty in making awards in some of the departments, from the fact that the different branches of industry were not properly classed. This was particularly the case in the second and third, which should have been made into at least five departments. Your Committee would recommend that the practice inaugurated by them, requiring contestants for department medals to furnish written statements of value of exhibited articles be continued, and that many of the communications already received be published in the society's annual report, as they contain valuable statistical data regarding manufactures and other productions, which will prove of great benefit to the public.

All of which is respectfully submitted.

Yours, truly,

LELAND STANFORD,
GEORGE K. GLUYAS,
HORACE D. DUNN,
W. B. EWER,
J. G. McCULLOUGH,
B. B. REDDING,
J. F. HOUGHTON,
Committee.

REPORT OF THE COMMISSIONER

TO THE

PARIS EXPOSITION, 1867.

NOTES UPON THE UNIVERSAL EXPOSITION

AT PARIS, 1867,

BY WILLIAM P. BLAKE,

COMMISSIONER FOR THE STATE OF CALIFORNIA TO THE UNIVERSAL EXPOSITION AT PARIS, 1867, AND DELEGATE OF THE STATE BOARD OF AGRICULTURE.

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LIST OF EXHIBITORS OF OBJECTS FROM CALIFORNIA AT THE PARIS EXPOSITION OF 1867.

CATALOGUE OF THE MINERALS AND ORES SENT FROM CALIFORNIA TO THE EXPOSITION.

LETTER TRANSMITTING THE REPORT.

Hon. H. H. Haight,
Governor of the State of California:

Sir: I have the honor to submit the following report upon the Paris Universal Exposition of eighteen hundred and sixty-seven. It consists of brief notices of some of the objects and industries which appeared to be of special importance or interest to California, and it is based partly upon a series of letters which, during the progress of the Exposition, I addressed to the Mining and Scientific Press, of San Francisco, and which were published. These letters have been revised and greatly augmented.

The variety of productions of California displayed at Paris was secured, in great part, by the joint exertions of the State Agricultural Society and a Committee of the Chamber of Commerce, including citizens of San Francisco. The influence and aid of the daily press of San Francisco was also freely given, and the Pacific Mail Steamship Company and the Panama Railroad Company transported all the articles over their lines without charge.

Owing to the absence of any appropriation by the State to pay the expenses of the representation at Paris, my arrival there was delayed until June. At that time most of the objects sent from California had arrived safely, and through the attention and care of Mr. Edgar Mills, of Sacramento, Delegate of the State Board of Agriculture, had already been placed in the Exhibition.

The sum of one thousand dollars, raised by subscription among the citizens of San Francisco, was forwarded to me, and had been applied towards the incidental expenses of the representation.

Very respectfully, your obedient servant,

WILLIAM P. BLAKE,

Commissioner for the State of California to the Universal Exposition at Paris, eighteen hundred and sixty-seven, and Delegate of the State Board of Agriculture.

REPORT

UPON THE

UNIVERSAL EXPOSITION AT PARIS, 1867.

CHAPTER I.

GENERAL VIEW OF THE PARIS EXPOSITION OF 1867.

THE BUILDING.

The general plan and arrangement of the Universal Exposition of eighteen hundred and sixty-seven was the result of the observation and experiences of the former great International Exhibitions at London in eighteen hundred and fifty-one, at Paris in eighteen hundred and fifty-five and at London in eighteen hundred and sixty-two. In those Exhibitions grand architectural effects were attempted, and large sums were expended in exterior and interior decoration. In the Exhibition building of eighteen hundred and sixty-seven all architectural display was subordinated to the convenience of grouping and display of the various objects contributed. The leading feature of the plan was the division of the space into seven concentric galleries, each one devoted to a particular group or class of objects.

The form of the building was generally considered to be nearly elliptical, but it was in fact a parallelogram, with rounded ends. Its greatest length was four hundred and eighty-two metres (five hundred and twenty-seven yards), its breadth, three hundred and seven metres (four hundred and six yards). The outer gallery was twelve hundred metres, or three fourths of a mile in length. A central space was reserved for a garden, with fountains and statuary. The whole building was bisected in its

length by a main avenue, crossed at right angles by three others, which, together with avenues or passages radiating from the central space, gave convenient passage from one gallery or group to another. The whole space, thus divided, measured one hundred and forty-six thousand square metres, or thirty-six acres. The superficial area of the building, with the park, was nearly one hundred acres. The total superficial area of the building of the Great Exhibition at London in eighteen hundred and fifty-one was about twenty acres; of the Palace and its dependencies at Paris in eighteen hundred and fifty-five, about thirty-seven acres; and of the International Exhibition of eighteen hundred and sixty-two at London, about twenty-four acres.

Of the total space one hundred and fifty-one thousand seven hundred and fifty and forty-six hundredths square metres in the building of eighteen hundred and sixty-seven, according to the official table, France occupied sixty-three thousand six hundred and forty and eighty-eight one-hundredths; Great Britain, twenty-one thousand and fifty-nine and eighty-seven one-hundredths; Prussia, twelve thousand seven hundred and sixty-five and twenty-seven one-hundredths; Austria, eight thousand three hundred and sixty-two and fifty-eight one-hundredths; Belgium, six thousand nine hundred and ninety-three and ten one-hundredths; Russia, six thousand and sixty and seventy one-hundredths; the United States, three thousand nine hundred and forty-four and seventy-four one-hundredths square metres.

In the Exhibition of eighteen hundred and fifty-one the total number of exhibitors was between fifteen thousand and sixteen thousand; in eighteen hundred and fifty-five, twenty-three thousand nine hundred and fifty-four; in eighteen hundred and sixty-two, twenty-eight thousand six hundred and fifty-three; and in the Exhibition of eighteen hundred and sixty-seven, the number reached sixty thousand. Of this number France had eleven thousand six hundred and forty-five exhibitors; England, twenty-one thousand; and the United States, seven hundred and seventy-eight.

The weight of the different objects exhibited was not less than twenty-eight thousand tons. The communication established by rail between the Palace and the railroads of the continent furnished the means of conducting and installing with the necessary care and celerity this enormous mass of material, which, for the most part, arrived at the end of the month of March.

The iron pillars and girders used in the construction of the building weighed thirteen thousand five hundred tons; the windows and skylights required sixty-five thousand square metres of glass; the masonry fifty-two thousand cubic metres of stone and brick, and the woodwork fifty-three thousand square metres of plank. The length of the sewers was five miles. The steam for the engines was generated outside of the building, and was conveyed by pipes under the surface of the ground a distance of one hundred feet.

The motive power required to put the various machines exhibited in motion was more than that of one thousand horses.

The machine gallery was divided into fifteen portions, corresponding with the requirements of the various nations, as follows: France, eight portions, with a total force of three hundred and five horse power; Belgium, one portion, forty horse power; North German Confederation, one portion, thirty-five horse power; Southern Germany, one portion, fifteen horse power; Austria, one portion, twenty horse power; United States, one portion, fifty horse power; Great Britain, one portion, one

hundred horse power. The mode of transmission of the power was by shafts overhead, supported on columns entirely disconnected with the frame of the gallery of the building, in order to avoid any unpleasant jar or vibration. There were two parallel main shafts, with an average diameter of nine one-hundredths of a metre and a velocity of one hundred revolutions a minute. They were so arranged as to form a polygon, of which the sides had an average length of about fourteen metres. These sides formed angles of about five degrees, and the connections were made either by a Cardan joint, by toothed gear or other method adopted by the exhibitor.

The supply of water for the building and Park was equal to that required for a city of one hundred thousand inhabitants, and it was provided by the Exhibition and not obtained from the city. A high and low service was organized, as a great part of the consumption, such as the cascades in the Park, did not require high pressure. The high service included a reservoir of four thousand metres capacity, established at the summit of the Trocadero, at the height of thirty-two metres (about one hundred feet) above the level of the Exhibition building, and a hydraulic establishment by the side of the Seine, just below the Bridge of Jena. The low service was fed by the pumps of the great marine engine of Indret, of one thousand horse power, placed by the river above the bridge. These pumps were capable of lifting twelve hundred cubic metres of water an hour. The high service supplied the irrigation of the Park, the fountains, the hydrants, etc., and the low service the condensers, the boilers, the cascades and the canals.

Arrangements were also made for a large supply of air to aid the natural ventilation. This was forced into the building by separate engines and large pump blowers, requiring in the aggregate one hundred horse power. This air, which it was estimated had a volume of seven hundred thousand metres per hour, was delivered through sixteen radial passages, corresponding with those in the building.

In the construction of this building upwards of three hundred and seventy thousand cubic metres of soil had to be removed for foundations, drains and water pipes, and air passages. The outer circle was excavated so as to give a succession of vaulted cellars, built of stone and concrete and lined with cement. The two interior galleries of the superstructure were built of stone, and the seven others were of iron. The outer gallery, devoted to engines and machinery, was the highest and broadest of all, and its roof was sustained by one hundred and seventy-six iron pillars, which supported eighty-eight arched ribs of iron. The covering of the roof was made of corrugated iron plates.

It will be noted that the form and arrangement of the galleries of the building corresponded with the classification or grouping of objects adopted by the Imperial Commission, which was briefly as follows:

LIST OF GROUPS, WITH THE CLASSES ATTACHED.

Groups.	Class.
GROUP I.—WORKS OF ART.	
Paintings in oil	1
Other paintings and drawings	2
Sculpture and dye-sinking	3
Architectural designs and models	4
Engraving and lithography	5
GROUP II.—APPARATUS AND APPLICATION OF THE LIBERAL ARTS.	
Printing and books	6
Paper, stationery, binding, painting and drawing materials	7
Applications of drawing and modelling to the common arts	8
Photographic proofs and apparatus	9
Musical instruments	10
Medical and surgical instruments and apparatus	11
Mathematical instruments and apparatus for teaching science	12
Maps and geographical and cosmographical apparatus	13
GROUP III.—FURNITURE AND OTHER OBJECTS FOR THE USE OF DWELLINGS.	
Fancy furniture	14
Upholstery and decorative work	15
Crystal fancy glass and stained glass	16
Porcelain, earthen ware and other fancy pottery	17
Carpets, tapestry and other stuffs for furniture	18
Paper hangings	19
Cutlery	20
Gold and silver plate	21
Bronzes and other art castings and repoussé work	22
Clocks and watches	23
Apparatus and processes for heating and lighting	24
Perfumery	25
Leather work, fancy articles and basket work	26
GROUP IV.—CLOTHING (INCLUDING FABRICS) AND OTHER OBJECTS WORN ON THE PERSON.	
Cotton thread and fabrics	27
Thread and fabrics of flax	28
Combed wool and worsted fabrics	29
Carded wool and woollen fabrics	30
Silk and silk manufactures	31
Shawls	32
Lace, net, embroidery and small ware manufactures	33
Hosiery and underclothing and articles appertaining thereto	34
Clothing for both sexes	35

Groups.	Class.
Jewellery and precious stones	36
Portable weapons	37
Travelling articles and camp equipage	38
Toys	39
GROUP V.—PRODUCTS, RAW AND MANUFACTURED, OF MINING INDUSTRY, FORESTRY, ETC.	
Mining and metallurgy	40
Forest products and industries	41
Products of the chase and fisheries; uncultivated products	42
Agricultural products (not used as food)	43
Chemical and pharmaceutical products	44
Specimens of the chemical processes used in bleaching, dyeing, printing, etc	45
Leather and skins	46
GROUP VI.—APPARATUS AND PROCESSES USED IN THE COMMON ARTS.	
Apparatus and processes of the art of mining and metallurgy	47
Agricultural apparatus and processes used in the cultivation of fields and forests	48
Apparatus used in shooting, fishing tackle and implements used in gathering fruits obtained without culture	49
Apparatus and processes used in agricultural works and in works for the preparation of food	50
Apparatus used in chemistry, pharmacy and in tan yards	51
Prime-movers, boilers and engines specially adapted to the requirements of the Exhibition	52
Machines and apparatus in general	53
Machine tools	54
Apparatus and processes used in spinning and ropemaking	55
Apparatus and processes used in weaving	56
Apparatus and processes for sewing and for making up clothing	57
Apparatus and processes used in the manufacture of furniture and objects for dwellings	58
Apparatus and processes used in paper making, dyeing and printing	59
Machines, instruments and processes used in various works	60
Carriages and wheelwrights' work	61
Harness and saddlery	62
Railway apparatus	63
Telegraphic apparatus and processes	64
Civil engineering, public works and architecture	65
Navigation and lifeboats	66
GROUP VII.—FOOD (FRESH OR PRESERVED, IN VARIOUS STATES OF PREPARATION).	
Cereals and other eatable farinaceous products and the products derived from them	67

Groups.	Class.
Bread and pastry	68
Fatty substances used as food, milk and eggs	69
Meat and fish	70
Vegetables and fruit	71
Condiments and stimulants, sugar and confectionery	72
Fermented drinks	73
GROUP VIII.—LIVE STOCK AND SPECIMENS OF AGRICULTURAL BUILDINGS.	
Farm buildings and agricultural works	74
Horses, asses, mules	75
Bulls, buffaloes, etc	76
Sheep, goats	77
Pigs, rabbits	78
Poultry	79
Sporting dogs and watch dogs	80
Useful insects	81
Fish, crustacæ and mollusca	82
GROUP IX.—LIVE PRODUCE AND SPECIMENS OF HORTICULTURAL WORKS.	
Hothouses and horticultural apparatus	83
Flowers and ornamental plants	84
Vegetables	85
Fruit trees	86
Seeds and saplings of forest trees	87
Hothouse plants	88
GROUP X.—ARTICLES EXHIBITED WITH THE SPECIAL OBJECT OF IMPROVING THE PHYSICAL AND MORAL CONDITION OF THE PEOPLE.	
Apparatus and methods used in the instruction of children	89
Libraries and apparatus used in the instruction of adults at home, in the workshop or in schools and colleges	90
Furniture, clothing and food from all sources, remarkable for useful qualities combined with cheapness	91
Specimens of the clothing worn by the people of different countries	92
Examples of dwellings characterized by cheapness combined with the conditions necessary for health and comfort	93
Articles of all kinds manufactured by skilled workmen	94
Instruments and modes of work peculiar to skilled workmen	95

To each of the first seven of these groups a circle or gallery of the building was arranged thus: Group I—Works of Art—occupied the inner circle or gallery; Group VI—the engines, machines, etc.—were placed in the outer gallery, a portion of which, along the outer side, was devoted to Group VII; and here, for example, were arranged the cereals,

the seeds, dried fruits, wines and liquors. Group V—Raw and manufactured productions, such as minerals, ores, forest products, etc.—were placed in the gallery adjoining that containing the machinery. By following these galleries the visitor passed in succession among the productions similar in kind of different countries, while by following the avenues the visitor saw in succession the various productions and manufactures of the same country.

After the adoption of this system it was decided to devote a portion of the inner circle to antiquities, so arranged as to give an approximate history of the progress of the arts from the earliest periods to the present time. This became a very interesting part of the Exposition to all classes of visitors. Even the pre-historic period was represented by collections of flint and bone implements from the caves and from the lake dwellings of Switzerland. The bronze period was also illustrated, and so on through the great periods of human history to the present age of steel.

The nature of the articles shown in this gallery of the "History of Human Labor" appears more fully by the following enumeration in the classification, by periods, adopted by the Imperial Commission:

First Epoch—Gaul before the use of metal. Utensils in bone and stone, with the bones of animals that have now disappeared from the soil of France, but found with these utensils, and showing the age to which they belong.

Second Epoch—Independent Gaul. Arms and utensils in bronze and stone. Objects in terra cotta.

Third Epoch—Gaul during the Roman rule. Bronzes, arms, Gaulish coins, jewellery, figures in clay; red and black potteries, incrusted enamels, etc.

Fourth Epoch—The Franks to the crowning of Charlemagne (A. D. eight hundred). Bronzes, coins, jewels, arms, pottery, MS. charters, etc.

Fifth Epoch—The Carlovingians, from the commencement of the ninth to the end of the eleventh centuries. Ivory sculptures, bronzes, coins, seals, jewels, arms, MS. charters, etc.

Sixth Epoch—The middle ages, from the commencement of the twelfth century to Louis XI (inclusive), fourteen hundred and eighty-three. Sculpture (statuary and ornamental), ivory, wood, furniture, bronzes, coin, seals, jewels, arms and armor, MS., miniatures, enamels, pottery, stained glass, tapestry, embroidery, dresses, etc.

Seventh Epoch—The Renaissance, from Charles VIII to Henry IV (A. D. sixteen hundred and ten). Sculpture (statuary and ornamental), ivory, sculptured wood, bronzes, coins, medallions, seals, jewels, arms, cutlery, watch-making, miniatures, MS., painted enamels, varnished pottery, pottery called Henry II and Bernard Palissy, glass work, stained glass, tapestry, embroidery, bindings, etc.

Eighth Epoch—Reigns of Louis XIII and XIV (A. D. sixteen hundred and ten to seventeen hundred and fifteen). Sculptures, ivories, furniture, bronzes, coins, medallions, seals, jewels, arms, watches, miniatures, MS., enamels, pottery of Nevers and Rouen, porcelain of Rouen and St. Cloud, marqueterie tapestry, embroidery, etc.

Ninth Epoch—Reign of Louis XV (A. D. seventeen hundred and fifteen to seventeen hundred and seventy-four).

Tenth Epoch—Reign of Louis XVI and the Revolution (A. D. seventeen hundred and seventy-four to eighteen hundred).

THE PARK.

The visitor to the Exhibition was at once forcibly impressed with the importance and extreme interest of the Park as part of the Exhibition. It was most tastefully laid out with avenues and winding paths, and was adorned with trees, shrubs and flowers, all planted since the ground was first broken for the foundation of the Palace, on what was previously the barren and indurated surface of the *Champs de Mars*. A few short months sufficed to make a total change. Water was brought in, artificial lakes, canals and streams were made; grottos were built and gardens were planted with flowers; constructions of all kinds arose as if by magic, and at the opening of the Exhibition examples were seen of the peculiar architecture of almost all the nations of the earth, from the tent of the wandering Arab to the gilded palace of Europe. In the vicinity of the Yankee school-house one could see a palace of the Bey of Tunis, an Egyptian temple, the catacombs of Rome, the temple of Xochicalco, Mexico, with full sized models of its ancient altars, a Protestant church and a Turkish harem. A small American farm-house was also erected and was visited by thousands of persons.

The main entrance to the Exhibition was at the end turned towards the Seine, opposite the Bridge of Jéna. A grand avenue about forty feet wide led directly through the Park to the building. This was the official avenue, and it was bordered by tall ornamental columns, which sustained a canopy of green velvet, studded with gold stars. At the gate you passed between two monumental bronze fountains about forty feet high and with basins fifty feet in diameter. That upon the right was of cast iron, from the celebrated foundries of Durenne, at Somnevoire, which contributed many other objects of interests to the interior of the building. A little beyond, six tall columns of polished marble, of different colors, ornamented the border of a path leading to a Gothic church on the left, which commanded attention by the beauty of its form and finish and its evident solidity and apparent permanence, although only a temporary edifice. Its roof afforded an opportunity for the display of tiles of various patterns and colors, and its windows for the exhibition of stained glass work, by different artists. Near the church rose an iron light-house from the water of an artificial lake. Two buildings of iron and glass, one on each side of the entrance and next beyond the large fountains, were devoted to exhibitions of iron and steel. One contained huge ingots of cast steel, three feet square and broken across, so as to show the nature of the grain. Here, too, were enormous girders, in one piece; railroad rails as straight almost as the bed of a planing machine, and again twisted into spirals and tied into knots, so as to display to advantage their extraordinary strength and toughness. Beyond, but yet at the side of the grand avenue, a building was devoted to the display of English ordnance and munitions of war, from a rifle to the celebrated Whitworth and Armstrong guns of different sizes, with the shot and shell peculiar to each.

Alongside of this building there was a pleasing vista over green lawns and parterres of flowers to the American *annexe* beyond, where could be seen the beautiful locomotive and various agricultural machines. On the left of the avenue was a building for the display of windows of stained and painted glass, to which the art of photography had lent its aid. Portraits and photographs were there reproduced in all the brilliance and permanence of color of stained glass.

In continuing a walk toward the entrance of the building, the visitor

reached a model English cottage of striking beauty, adorned with several varieties of exterior finish in incised plaster, in parti-colored brick, in beton, slate, and in tiles of different patterns. In the interior the different manufacturers of glazed and encaustic tiles vied with each other in producing the most pleasing patterns upon the floors and walls. The different forms of ranges and stoves were displayed in almost endless variety. A few steps beyond took the visitor to the Imperial Pavilion, in Moorish style, and superbly furnished with the choicest productions of France. The marble steps were inlaid with fine mosaics, and were guarded by two Imperial eagles in bronze, standing upon gilt spheres. The building contained three apartments, and was occupied by the Emperor when visiting the Exhibition.

These details upon some of the structures met in passing through the Park will serve to show the general character of the other portions, crowded, as they were, with buildings of the greatest interest in themselves, and for their contents. Many of them contained collections which were complete exhibitions in themselves. Spain, for example, filled a large building with a representation of its mineral and agricultural productions. Russia had several buildings—one, a model farm-house, was devoted to the products of its fisheries, to its furs, costumes of its interior tribes, and to its agricultural machines and products. A large stable contained the different breeds of horses, represented by choice individuals. The Russian Commissioners had an office in a model Russian cottage. In the part of the Park given to Holland, a brick building, standing by itself among the shrubs and trees, was a complete diamond-cutting establishment, where several workmen were constantly engaged in cutting and polishing diamonds—an art that is seldom exhibited to the public.

THE RESERVED GARDEN.

A portion of the Park was separated from the rest of the Exhibition by a long line of ornamental iron railings, and devoted to trees, shrubs and flowers from all climes. An enormous structure of glass and iron crowning an eminence above a lake afforded a tropical atmosphere for a large display of palms, ferns and bananas. Some of these plants were at least twenty feet high, as for example the *Phœnix dactilifera;* and there were tree ferns eight feet high, besides numerous species of palms growing together, so as to make a complete forest In other portions of the garden there were large conservatories and aquariums devoted to the yuccas and agaves, to the cactacea and to the aquatic plants—such as the water lilies, including the celebrated Victoria regia. The borders and terraces of the grounds were planted with a great variety of shrubs and evergreen plants, amongst which the plants of Japan and California were conspicuous—such, for example, as the *thujas*, the *euonymus*, the *librocedus* and the *sequoia gigantea*, mingled with the hollys and yews of Great Britain.

The management of lawns, gravel-walks, borders and parterres of flowers was well shown by the exquisitely kept plats of grass and borders between the winding paths and along the artificial stream. The competitive exhibitions of flowers were made there according to the season, and thus insured a constant but ever varying brilliant display. The grottos and the fish aquariums gave an additional attraction to the place, and it was a delightful resort after the fatigue of a day in the building.

BILLANCOURT.

The horticultural and agricultural display at the Champ de Mars was supplemented by one at the Island of Billancourt, in the Seine, about three miles below the Exposition building. The objects and processes shown there were such as could not be conveniently exhibited in the building or in the Park—such as many of the agricultural machines, the various domestic animals, and the operations of ploughing, sowing, reaping, threshing, etc. The superficial area of this island is about twenty-three hectares (about fifty-seven acres) and the soil, being formed of the alluvions of the river, is quite deep and fertile.

The competition of agricultural machines was announced to occur in the following order:

April.—First fortnight—Ploughs of all sorts, hydraulic machines, steam machines.

Second fortnight—Steam ploughs, harrows, rollers, weeding machines, scarifiers, apparatus for the manufacture of drainage pipes and the preparation of clay.

May.—First fortnight—Sowing and manuring machines, machines for stripping hemp and flax, vehicles, harness, weights, churns and dairy utensils.

Second fortnight—Mowing and haymaking machines, rakes, apparatus for the compression and preservation of hay.

June.—First fortnight—Competition of farriery, and examination of specimens of rural establishments.

Second fortnight—Hay cutter, root cutter, hoes, ploughs.

July.—First fortnight—Apparatus for shearing various domestic animals.

Second fortnight—Reaping machines and apparatus for the corn harvest.

August.—First fortnight—Threshing machines, and apparatus for cleaning and preserving corn.

Second fortnight—Ovens, apparatus for cooking vegetables, washing linen, manufacture of manure.

September and October.—Examination of specimens. Various agricultural manufactures.

STATISTICAL INFORMATION.

The idea of an Exposition, as well as an Exhibition, was in a great measure realized. The arrangement and grouping was such as to invite and stimulate comparison, as well as to afford the greatest convenience for the study of different departments. Nearly all the different countries represented published descriptive catalogues, with interesting statistics and information appended to them. The most extensive and elaborate work of this kind was published by the Russian Commission, in two handsome octavo volumes, one of them a statistical view of the productive forces of Russia, and the other a descriptive catalogue of the objects exhibited. Works of this character were published by Prussia, Belgium, Austria, Sardinia, Brazil and Chile, besides smaller pamphlets and circulars by the Central American republics, Australia and the Hawaiian Islands. Mr J. P. Whitney, the Commissioner from Colorado, published a notice of the Territory and its minerals in several languages, and distributed them freely; and Colonel D. Buel, of Austin, published

a little volume in English and French descriptive of the various mining districts of the eastern part of Nevada, accompanied by a map. All of these documents giving statistics of the resources and productions of the Pacific States were eagerly sought for, and many applications were made for statistics of the State of California.

DISTRIBUTION OF PRIZES.

The work of the juries commenced as soon as the Exhibition opened, and the awards were made very soon thereafter, and in many cases before some of the contributions were fairly placed and labelled. The grand ceremony of the distribution of prizes was on the first of July, at the Palace of Industry, the building erected for the Exhibition of eighteen hundred and fifty-five. The recipients of grand prizes and gold medals received them from the hands of the Emperor, in the presence of seventeen thousand spectators, all comfortably seated in that magnificent hall.

A report was presented at this time by M. Rouher, Minister of State and Vice President of the Imperial Commission, enumerating in a general way the principal operations of the Commission and of the Jury, stating the total number of awards and citing some of the great international advantages derived from the Exposition.

The International Jury was composed of six hundred members, chosen from men distinguished in science, industry, commerce and art, and of various nationalities. This Jury awarded:

Grand prizes	64
Gold medals	883
Silver medals	3,653
Bronze medals	6,565
Honorable mentions	5,801

The Jury of the new order of prizes awarded twelve prizes and twenty-four honorable mentions. In addition, the Emperor was pleased to confer upon some of the most eminent of the competitors in the Exhibition the Imperial Order of the Legion of Honor.

The prizes awarded to exhibitors from California were as follows:

State of California*—Cereals. Silver medal.

Dr. J. B. Pigné, San Francisco—Collection of California minerals. Silver medal.

William P. Blake, California—Collection of California minerals. Silver medal.

* The official announcement of this award reads: *"Le Gouvernement de Californie.—Céréals."* As the State of California was not an exhibitor, this destination of the award is apparently the result of misapprehension. The exhibitors of cereals were Mr. D. L. Perkins, Mr. J. W. H. Campbell and Mr. J. D. Peters. The display made by Mr. Perkins included one hundred and twenty varieties of seeds, neatly arranged in glass bottles and labelled, and, together with the photograph, was the most prominent. It is the opinion of the Commissioner that the medal should either be given to Mr. Perkins or to the exhibitors of cereals jointly.

Mission Woollen Mills, San Francisco—Exhibition of blankets, cloths and flannels. Bronze medal.

C. E. Watkins, San Francisco—Photographs of Yosemite Valley. Bronze medal.

Brown & Level, California—Self-detaching boat tackle. Bronze medal.

Buenavista Vinicultural Society—Sparkling wine. Honorable mention.

CHAPTER II.

WOODS AND PRODUCTS OF THE FOREST.

FRANCE.

The forest products and industries of nearly every country were represented in the Exposition, by sections of trees, planks, boards, mouldings, etc., and by collections of the tools used for cutting, hewing and sawing.

Of all these collections, that made by France, through the "Administrator of the Forests," was the most complete, methodical and interesting. It occupied a space about sixty feet in length, in the second gallery, devoted to Group V, and was very tastefully displayed. Sections of all the principal kinds of trees in the Empire were ranged along the wall with the interspaces filled with green moss. Each section of a tree was about six inches thick, and included the bark, so that the whole structure and outer form and appearance of the trunk was clearly shown. Above these, on a table which extended around the room, smaller sections and portions of dressed and worked timber were arranged, with herbaria, photographs and drawings of forest trees. The tools used were grouped above, on the wall, around centre pieces, formed of boar's heads. In the centre of the room a broad table sustained various models of forests and of sawmills, and of apparatus used in felling and transporting timber. There were also models of the buildings erected for the keepers' lodges, and of cottages for the laborers. Some of the plans in the relief exhibited the important operations of the administration of forests, such as the replanting of the Alps. A large forest chart upon the wall, of France, showed in the most striking manner the distribution of the wooded parts of the country and the relation which exists between them and the geological constitution of the soil. The whole collection was completed by a series of specimens of the various destructive forest insects.

There was also a series of publications on practical or scientific questions, relating to sylviculture, and a fine collection of photographs of cones and foliage of the various pines and firs.

The woodlands of the Empire of France amount to eight million nine hundred thousand hectares (a hectare is equal to two acres, one rood and thirty-five perches), divided as follows:

First—One million one hundred thousand hectares belonging to the State, of which forty-nine per cent. is in timber (five hundred and thirty-nine thousand hectares), and fifty-one per cent. in coppice, with or without timber.

Second—Two million hectares belonging to communes or public establishments, of which thirty-six per cent. is covered with timber, and sixty-four per cent. with coppice.

Third—Five million eight hundred thousand hectares of private woodlands, seventeen per cent. of which is timbered, and the remainder in coppice, with or without timber.

The annual products of these forests are in the following proportions: Three for the State lands, two and seventy-five hundredths for those of the communes and two for those of private owners—giving a gross total of about twenty million cubic metres of timber, divided as follows: Timber and working woods two million, and fuel, eighteen million cubic metres. These resources are now increasing, in consequence of the numerous improvements in the management of forests and of increased facilities for transporting from a distance. The above and some of the succeeding statistics are extracted from an admirable report by De Gayffier, a member of the Admission Committee of Class Forty-one. Notwithstanding, however, all the improvements which have been made and the extensive replanting of the Alps, the Pyrenees and other districts, the production is still far from sufficient to supply the demands of consumption, and the deficiency is supplied by importations from Norway, Russia, Germany and Italy. The importation of common woods of all kinds, which in eighteen hundred and fifty-five did not amount in value to seventy million of francs, was valued at one hundred and fifty-four million francs in eghteen hundred and sixty-five.

The annual consumption of wood in France is as follows:

First—In timber for construction purposes and wood used in manufactures:

Consumers.	Cubic metres.
The naval and mercantile marine	118,000
Artillery and engineering	30,000
Railways	600,000
Building	1,600,000
Lath wood and espaliers, etc	3,700,000
River navigation, carriage building, furniture, utensils, etc....	4,300,000
Total	10,348,000

Second—Firewood, thirty millions of steres; and charcoal, fifteen millions of steres*.

One of the largest tree sections shown from France was a white oak from Auvergne, which measured six meters in circumference—a little

* A *stere* consists of three hundred and fifty-three thousand one hundred and seventy-four feet.

over six feet in diameter—and was two hundred and thirty-seven years old. The mountains of the Vosges afford sections of firs nearly five feet diameter, and near them in the display were sections of the pine which has been so successfully planted along the sandy barrens of the seacoast. These trees grow with great rapidity, and annually add one centimetre to their thickness, so that in one hundred years they will attain a diameter of about three feet.

THE FOREST EXHIBITION OF BRAZIL.

Next to the exhibition of the woods of France, that made by Brazil was perhaps the most attractive by its peculiar arrangement. A room twenty-five feet square, lighted from above, was devoted to these woods alone. The walls and ceiling were painted in imitation of the natural forest. You saw around you the plants and trees of the Amazon, with their gorgeous foliage. The spaces between the branches and leaves overhead were cut out and shaded so as to give a subdued light, like that in the deep recesses of the forest.

In the center of this room the specimens of wood were displayed in a grand pyramidal pile. Each tree was shown by a portion of its trunk, of full size and about two feet long. The ends of each were cut in three different directions, so as to show a cross section, an oblique section and one parallel with the grain. One half of the cut surfaces were polished and varnished. The bark was left on, so that the whole outward appearance of the trunk was preserved. A label was attached to each specimen, giving the common name and the botanical name, according to Endlicher.

THE FOREST PRODUCTS OF CANADA.

Canada made a very respectable show of its resources in lumber of various kinds. There were sections of the principal trees, with their bark, in great number. They were usually about two feet long, and were super-imposed one upon another, so as to make a base for several columns of square logs, of different woods for building purposes, set up about eight feet apart. These supported above a square timber of yellow pine, fifty feet long and ten feet square. The niches formed by this disposition of the timber were filled with smaller specimens, and by panels of dressed and polished planks of pine, white wood, walnut and birch. The Abbé Brunet, of Quebec, Canada, sent a fine collection of Canadian woods, with herbaria and a series of photographs of trees and of plantations. He made the whole complete and instructive by a printed catalogue of sixty-four pages, which contained a large amount of valuable information upon the trees of Canada. This collection, for its uniformity, neatness and pleasing appearance, was one of the most attractive in the Exhibition, and it received a gold medal.

The woods were shown not only in sections but in polished planks about two feet long and eighteen inches wide. The most noticeable were the blistered black walnuts and the birdseye maple, the blistered ash and the oak. The following were given as the prices, per cubic foot, of some of these woods:

White pine	$0 12
Blistered maple	20
Blistered ash	15
Blistered oak	30
White cedar	15

Most of these trees attain a height of one hundred and fifty to one hundred and sixty feet, and vary from four to six feet in diameter.

AUSTRALIAN FOREST TREES.

In the Australian section there was an extensive series of logs and polished planks of the *Eucalyptus Araucaria*, the acacia and others. These woods generally are very hard and dense, and as they can all be naturalized in California, and many of them are already introduced, some facts about them have a special interest.

The extensive forest region of Australia commences in the vicinity of Cape Otway and extends, with occasional interruptions, through the southern and eastern part of Victoria, and thence chiefly on the seaward slopes, through East Australia, a distance altogether of about three thousand miles. Throughout this region the vegetation assimilates more than elsewhere to the floral features of continental and insular India. The eucalypt, which preponderate in the forests of the southern ranges, gradually disappear toward the north. Two species of this genus—*Eucalyptus coriacea* and *E. gunnii*—form dense thickets, even at a height of five thousand feet, within a thousand feet of the point where snow rests for the greater part of the year. Both of these species, it is said, would well bear transplanting to other countries in the temperate zone.

It has recently been ascertained that some species of the eucalyptus attain enormous dimensions in the recesses of the Australian forests, and the following observations upon them are extracted from Dr. Mueller's Essay*:

"The marvellous height of some of the Australian, and especially Victorian trees, has become the subject of closer investigation, since of late, particularly through the miners' track, easier access has been afforded to the back gullies of our mountain system. Some astounding data, supported by actual measurements, are now on record. The highest tree previously known was a *Karri-Eucalyptus* (*Eucalyptus colossea*) measured by Mr. Pemberton Walcott, in one of the delightful glens of the Warren River of Western Australia, where it rises approximately four hundred feet high. Into the hollow trunk of this karri three riders, with an additional pack-horse, could enter and turn in it without dismounting.

"On the desire of the writer of these pages, Mr. D. Boyle measured a fallen tree of *Eucalyptus amygdalina*, in the deep recesses of Dandenong, and obtained for it the length of four hundred and twenty feet, with proportions of width indicated in a design of a monumental structure, placed in the Exhibition; while Mr. G. Klein took the measurement of

Intercolonial Exhibition Essays, 1866. *Australian Vegetation, Indigenous or Introduced, considered*, especially in its bearings on the occupation of the Territory, and with a view of unfolding its resources. By Ferdinand Mueller, F. R. S., Director of the State Garden of Melbourne.

a eucalyptus on the Black Spur, ten miles distant from Healesville, four hundred and eighty feet high.

"Mr. E. B. Heyne obtained at Dandenong the following measurements of a tree of *Eucalyptus amygdalina*:

Measurement.	Feet.
Length of stem from the base to the first branch	295
Diameter of the stem at the first branch	4
Length of stem from first branch to where its top portion was broken off	70
Diameter of the stem where broken off	3
Total length of stem to place of fracture	365
Girth of stem three feet from the surface	41

"A still thicker tree measured three feet from the base, fifty-three feet in circumference.

"Mr. George W. Robinson ascertained in the back ranges of Berwick the circumference of a tree of *Eucalyptus amygdalina* to be eighty-one feet, at a distance of four feet from the ground, and supposes this eucalypt, toward the sources of the Yarra and Latrobe Rivers, to attain a height of half a thousand feet. The same gentleman found *Fagus Cunninghami* to gain a height of two hundred feet, and a circumference of twenty-three feet.

"Not merely, however, in their stupendous altitude, but also in their celerity of growth, we have, in all probability, to accede to Australian trees the prize. Extensive comparisons instituted in the botanic gardens of this metropolis prove several species of eucalyptus, more particularly *Eucalyptus globulus* and *Eucalyptus obliqua*, as well as certain acacias; for instance, *Acacia decurrens* or *Acacia molissima*, far excelling in their ratio of development any extra-Australian trees, even on dry and exposed spots, such into which spontaneously our blue gum trees would not penetrate. This marvellous quickness of growth, combined with a perfect fitness to resist drought, has rendered many of our trees famed abroad—especially so in countries where the supply of fuel or of hard woods is not readily attainable, or where for raising shelter, like around the cinchona plantations of India, the early and copious command of tall vegetation is of imperative importance. To us here this ought to be a subject of manifold significance. I scarcely need refer to the fact that for numerous unemployed persons the gathering of eucalyptus seeds—of which a pound weight suffices to raise many thousand trees—might be a source of lucrative and extensive employment; but on this I wish to dwell, that in Australian vegetation we probably possess the means of obliterating the rainless zones of the globe, to spread at last woods over our deserts, and thereby to mitigate the distressing drought, and to annihilate perhaps even that occasionally excessive dry heat evolved by the sun's rays from the naked ground throughout extensive regions of the interior, and wafted with the current of air to the east and south—miseries from which the prevalence of sea breezes renders the more littoral tracts of West and North Australia almost free. But in the economy of nature the trees, beyond affording shade and shelter, and retaining humidity to the soil, serve other great purposes. Trees, ever active in

sending their roots to the depths, draw unceasingly from below the surface strata those mineral elements of vegetable nutrition on which the life of plants absolutely depends, and which with every dropping leaf is left as a storage of aliment for the subsequent vegetation. How much lasting good could be effected, then, by mere scattering of seeds of our drought-resisting acacias and eucalypts and casuarinas at the termination of the hot season along any water course, or even along the crevices of rocks, or over bare sands or hard clays, after refreshing showers. Even the rugged escarpments of the desolate ranges of Tunis, Algiers and Morocco might become wooded; even the Sahara itself, if it could not be conquered and rendered habitable, might have the extent of its oases vastly augmented; fertility might be secured again to the Holy Land, and rain to the Asiatic plateau or the desert of Atacama, or timber and fuel be furnished to Natal and La Plata. An experiment instituted on a bare ridge near our metropolis demonstrates what may be done."

OTHER FOREST EXHIBITIONS.

The other colonies of Great Britain, especially the Indies, were well represented by large collections of the woods peculiar to each.

Norway sent a large assortment of worked lumber, such as planks, joists, flooring boards and mouldings. There are in this country three thousand three hundred sawmills, which employ eight thousand workmen. In eighteen hundred and sixty-five the exports of lumber amounted to eight hundred and sixty thousand tons, or twenty-six million eight hundred thousand steres, valued, approximately, at forty-five million six hundred thousand francs. A little more than half of this was sawed timber, and this portion was sent chiefly to England and France; the rough lumber is exported to England and Holland. The tongued and grooved stuff, six and one half inches by nine eighths thick, is worth one franc and a half per square metre.

Russia exhibited a fine collection of planks and mouldings, remarkable for their straight grain and freedom from blemishes. Mouldings four inches wide and three quarters of an inch thick are sold for one and a half kopecks the English foot.

Among other interesting exhibits of the various forest trees of that empire was one made in the form of books all of one size. The bark is solid and shows the bark of the tree. The covers are attached by hinges of leather and open in half so as to give two shallow boxes, in which are arranged the foliage, the fruit and the flower of the tree, together with the characteristic mosses and lichens of the trunk, and a specimen of the coal.

The name of the plant is printed upon morocco titles, which are attached in recesses cut in the bark of the back. This is one of the most pleasing methods of preparing and preserving a collection of native woods, and this notice may induce some of our amateurs to undertake the preparation of a similar collection for California at some future Exhibition.

The Grand Duchy of Finland sent a very interesting collection of woods, with a descriptive catalogue, from which much valuable information may be obtained.

AUSTRIAN FORESTS.

The woods and fruits of this State are considered as among the first in value of its natural productions. For variety, quality and cheapness

they are hardly rivaled in Europe. The Adriatic Sea, the River Vistula, which flows into the Baltic, the Elbe, which empties into the North Sea, and the rivers which reach the Black Sea, as well as the railroads, all give facilities for cheap transportation. With these advantages, the exportation of wood has been constantly increasing until it has reached a total value of seventy-five millions of francs.

The quantity of timber sent by the Administrator of Forests of the different States of Austria was so great that it could not be exhibited in the building, and it was therefore grouped outside in the *annexe*. The trunks of trees were cut into convenient lengths, which were reunited on the ground, so that their full dimensions were shown. The principal trees were oaks and spruces. Among them *Quercus pedunculata* and *Abies excelsa* are most conspicuous. The former is five feet in diameter at the butt, and is interesting as the wood which is largely used for the manufacture of wine and beer casks and barrels. A great number of staves of all sizes were shown in connection with the unworked woods. Some of these are fifteen feet long and are intended for a grand cask to hold one hundred thousand French litres. There are several agencies in Paris for the sale of these staves. This oak grows in deep alluvial soils and forms thick forests, in which the trees attain a height of more than one hundred feet, and a diameter of from four to five feet.

THE UNITED STATES.

In the midst of all these extensive and careful representations of the forest resources of the various countries, the citizen of the United States was mortified at the meagreness of our exhibition in the same line. All that we had to show of our vast forests, full of the choicest timber, could be laid upon a table ten feet long and three feet wide. There were two bundles of very good shingles from the far West, a few irregular bits of American wood, and the laurel panels and door from Boyd, of California. These last were very beautiful, but did not appear to have attracted the attention they deserved.

There was not any ornamental door in the exhibition equal to that sent from California, either in accuracy of carpentry or for beauty of grain and general finish. It was a fine exhibition of the remarkable capacity of the wood of the madrona for taking stains, in imitation either of mahogany, rosewood or black walnut.

A section of the great tree—the *Sequoia gigantea*—would have attracted great attention from all persons, and would have fully redeemed the extreme paucity of the United States display of forest products. It is to be regretted, also, that the samples of our ordinary commercial wood, such as the pine, redwood, cedar and fir were not sent on as intended.

CORK.

This is a forest product which is of great importance to the wine interest of California; and as it is possible that the cork tree might be introduced there with advantage, a few details will not be uninteresting.

The principal exhibition of cork was from Algeria, and consisted of slabs of raw "male cork," eight feet six inches long, with some of second growth, fifteen feet six inches long, and specimens of raw cork bark of second growth, eight years old. Some of these slabs were from four

to eight inches thick. The following explanatory statement is taken from the report of DeGayffier:

"Cork is the substance lying beneath the true bark of a particular kind of oak, called the cork oak, which grows principally in Italy, Corsica, Algeria, Spain and the south of France. The tree begins to furnish cork at the age of from twelve to fifteen years; but the first cork is of poor quality, and only fit to make floats and other coarse objects, and Spanish black, which is nothing more than cork burned in close vessels. After the first layer has been removed from the tree the cork bark is deposited with more regularity, and then yields material fit for the finer purposes, such as the making of wine and other corks, sheets and other well-known objects used for many purposes."

From the period already mentioned the bark may be removed from the tree once in eight or ten years, and the same tree will yield cork twelve or fifteen times. Raw cork, or that which has merely been rasped, comes principally from Italy, Spain, Portugal and Algeria. Spain supplies nearly the whole of the manufactured cork of commerce. Seville is the most important entrepot of this product. The importations into France in eighteen hundred and fifty-five were five hundred and thirty-two and a half tons, valued at two hundred and fifty-seven thousand two hundred and twenty-four francs. In eighteen hundred and sixty-five they had increased to three thousand eight hundred and fifty-five tons, valued at two millions five hundred and two thousand six hundred and ninety-six francs. The export amounted to one hundred and sixty-nine and a half tons in eighteen hundred and fifty-five, and in eighteen hundred and sixty-five it had reached the figure of one thousand three hundred and nineteen and a half tons, of the total value of one million two hundred and thirty-six thousand nine hundred francs.

The Government of France has encouraged the development of the riches of the cork forests of Algeria by giving long leases on merely nominal terms to several companies. Large sums have already been expended there in the preliminary barking of the trees, but as yet there has not been that measure of success that was anticipated. The natives have shown their ill will by burning several of the forests, and some of these enterprises have been abandoned.

RESINS.

The following data upon the sources and consumption of resin in France are from the report of De Gayffier:

"The maritime pine tree is the only tree in France from which resin is extracted. The cultivation of this tree constitutes the principal, if not the only wealth of the district lying between Bordeaux and Bayonne. According to the nature of the soil, the pine is tapped for resin between the ages of twenty and forty years. The operation consists in making long incisions in the trunk, whence the resin exudes and is collected in various ways. The natural results of the bleeding of the pine trees are: The soft gum, or resin, which, by distillation, yields turpentine; the *galipots*, an almost solid substance, which, by evaporation, forms in stalactites all down the tree; the *crottas*, a mixture of the two former products; the *varras*, which are the *galipots* entirely dry and ad-

hering to the tree. A pine tree, sixty to seventy years old, furnishes, on an average, about six to eight kilogrammes (fifteen to twenty pounds) of raw material, of which about one third is *galipots* and *varras*. The American war gave a great impulse to the resin trade. The following statistics will give an idea of the results: In eighteen hundred and fifty-five the exports of French resin did not amount to more than four thousand one hundred and thirty-three tons, of the total value of two million two hundred and fifty thousand francs. In eighteen hundred and sixty-five they had risen to the enormous total of five thousand two hundred and fifty tons, worth twenty-seven million two hundred thousand francs. The importations in eighteen hundred and sixty-five amounted to two thousand nine hundred and sixty tons, of the value of two million four hundred thousand francs."

STAVES.

The wood employed in this manufacture is called "merrain," and is split out by means of a tool called a coulter. They are made of all sizes, from eight inches to one hundred and seventeen in length, and from three to ten inches wide, and from one eighth to three eighths or more in thickness. They are chiefly produced in Germany, Russia, Turkey and the United States. The coopers of Europe are largely supplied from the United States. The best woods are oak and chestnut. White mulberry is used in Languedoc. The importation in France in eighteen hundred and sixty-five amounted to thirty-seven million six hundred thousand pieces, valued at twenty-six million three hundred thousand francs. Nearly the whole of this is consumed in the country.—*Condensed from De Gayffier's Report.*

OSIERS.

In France the osier is the chief material used in the basket trade, which is carried on chiefly in the valleys of Ver, Aubeaton and Hirson, in the Aisne, where osiers grow in large quantities. According to De Gayffier's report, accompanying the French exhibitions in this class: "In the Arrondissement of Verrins alone there are three thousand families engaged in basket making, who produce more than two million five hundred thousand francs worth annually, two thirds of which are exported to England and America. The importations amounted in eighteen hundred and fifty-five to one hundred and five tons, of a total value of three hundred and twenty-one thousand francs; and in eighteen hundred and sixty-five only to fifty-nine tons, of the value of fifty-three thousand francs. The importation of osiers in bundles, which in eighteen hundred and fifty-five was one hundred and five tons, had risen in eighteen hundred and sixty-five to one hundred and eighty tons, of the value of twenty-two thousand francs. The exports grew in the same period from fifty-nine tons to seventeen hundred tons, the value of the last named total being estimated at three hundred and seventy thousand francs."

The production of osiers, and the manufacture of baskets and hampers for fruits, vegetables and wines in bottle, will probably soon become an important industry in California.

MANUFACTURE OF PAPER FROM WOOD.

One of the most interesting exhibitions consisted of a machine in

action for the preparation of paper pulp, or stock from ordinary soft wood. This machine was constructed at the establishment of Decker Brothers & Co., at Canstatt, Wurtemberg, and was shown in the Park in a separate building. It is the invention of Henry Welter, paper manufacturer at Heidenheim, and was shown by himself and the constructors jointly. It is quite an extensive affair, and occupied considerable space, but was arranged so that the crowd always attracted to it could ascend by a broad stairway on one side of the machinery, and descend by a similar staircase on the other side. Billets of wood, cut and split to about the size ordinarily used in fireplaces, were constantly fed to the machine at one end, and by means of a large rasping or grinding cylinder were rapidly ground or torn into shreds and pulp, which was washed in water and finally delivered in several degrees of fineness at the other end. This paste is quite white and soft, and is used to a great extent to mix with the stock or pulp obtained from rags. Specimens of printing, writing and packing papers were shown, which contained twenty-five to sixty-six per cent. of this paste. There are already over thirty establishments in Germany for the manufacture of paper pulp from wood. This machine received a gold medal.

CHAPTER III.

IRON, STEEL, COPPER, ZINC, AND OTHER USEFUL METALS OF THE EXPOSITION.

IRON AND STEEL.

It was almost impossible to see and it is much less possible to describe all that was shown in this department. Nearly every country sent something that claimed attention, and Great Britain, France, Prussia, Austria and Russia made overwhelming displays of iron in all its stages of manufacture, from the rough ore to the pig of all grades; bar and plate iron; steel in ingots, bars, or rolled out or drawn into wire. Each iron-producing country seemed to vie with every other in the exhibition of the strength and fiber of its wrought iron and steel. Cases upon cases were filled up with bars of various sizes that had been bent, twisted and broken so as to display the grain to the best advantage. Wrought iron rods and bars and railway axles were shown twisted into every imaginable shape. Great round bars, from three to eight inches thick, were tied into knots. Railway iron was twisted until it looked like a long screw, and all without a crack or parting a fibre.

It is a satisfaction to know that the scientific and practical discussion of this subject has fallen into the hands of Mr. A. S. Hewitt, of New York, one of the Commissioners, who has a very complete and valuable report in preparation for our Government.

The United States, though not by any means fully represented in this department, had a very creditable display for variety and for purity and practical value. There were some large masses from the Iron Mountain of Missouri, and some from Lake Superior, and a few masses of the magnetic and specular ores of Northern New York. The specular ore of Sierra County, in our State, was also found in the Exhibition, and it was as pure and excellent in quality as any. The Peninsular Iron Company, of Detroit, Michigan, sent a suite of specimens of Lake Superior charcoal pig iron: No. 1, suitable for foundry purposes; No. 2, rolling mill iron; No. 3, car wheel iron; No. 4, mottled, for malleable purposes; No. 5, valuable for making malleable iron and for rolling mill purposes.

The Franklinite ore and metal was shown in connection with the

zinc ores and products of the New Jersey Zinc Company. The hard white iron made from this ore has already been imported and used in California, by the Union Iron Works, for making stamp shoes and dies and the jaws of rock crushers.

Messrs. Park & Brother, of the Black Diamond Steel Works, Pittsburg, Pennsylvania, made a fine exhibition of cast steel in bars, round, octagonal and flat, made at their works. It was accompanied by beautifully finished edge tools made from their steel.

SWEDISH IRON.

In the exhibition of ores, Sweden took the lead, not only in bulk of specimens, but in the richness and purity of the ore. Prussia exhibited a splendid suite of evenly trimmed specimens of the various kinds of ore used, chiefly brown iron ore and spathic iron (the carbonate).

The samples of Swedish magnetic ores were in such masses that some had to be left in the yard. They were about three feet long, and must have weighed a ton or two each. Ten of these were counted, and there was in addition, in the machine gallery, a grand pyramidal stack of iron and steel bars standing upon a foundation of blocks of ore from the various Swedish mines. The various pig irons were arranged in a tier just above the ore, and above this tier the steel and iron bars of all sizes and shapes were stacked up. The iron ores received the gold medal, the steel bars a silver medal, and the iron a bronze medal.

KRUPP'S STEEL.

The most extensive and the most costly display of steel, raw and manufactured, was sent by F. Krupp, of Essen, Rhenish Prussia. The Jury awarded him the grand prize. Krupp's works and manufactures are world renowned, and some statistical data in regard to them may be interesting.

The establishment has been in existence for the last forty years, and has been gradually developing and increasing until at the present time the works cover continuously a surface of about four hundred and fifty acres (English), two hundred of which are under roof. In these works eight thousand men are employed, in addition to two thousand more at the blast furnaces and iron pits on the Rhine and in Nassau. These works produced in eighteen hundred and sixty-six manufactures of steel of the aggregated weight of sixty-one thousand tons by means of four hundred and twelve smelting, reverberatory and cementing furnaces, one hundred and ninety-five steam engines, from two to one thousand horse power each, forty-nine steam hammers, one hundred and ten forges, three hundred and eighteen lathes, one hundred and eleven planing machines, sixty-one cutting and shaping machines, and many others of less consequence. No less than one hundred and twenty steam boilers are required to keep the engines in operation, and they evaporate one hundred and fifty thousand cubic feet of water in twenty-four hours.

The yearly production is valued at over seven million five hundred thousand dollars, and the various objects manufactured are distributed all over the world.

The representation in Paris consisted of some twenty or thirty large objects, of which the most prominent was a cylindrical cast steel ingot weighing forty tons, fifty-six inches in diameter, and standing nearly twelve feet high. It was forged at one end into an octagonal shape, and is

intended for a marine crank shaft. This huge block of crucible steel is the largest that has yet been made. In the first London Exhibition a block of two and one quarter tons weight was regarded with wonder, and received the only Council medal in the department of steel products. At the former Paris Exhibition a block of five tons was shown, and to the London Exhibition of eighteen hundred and sixty-two one of twenty tons was sent. This shows the rapid progress made in the scale of Krupp's operations with large masses of steel. The upper end of this monster ingot of forty tons was broken across so as to show the grain. One half of this broken surface had been ground down and polished as bright as a mirror, without developing the least defect or flaw. Not content with this proof of the density and uniformity of the ingot, they had cut a gash in the side about half way up, and taken out a chip about as large as one man could lift, and polished it, with satisfactory results.

To shape this great ingot a hammer weighing fifty tons was used. All the cast steel productions of the establishment, with the exception of disk centres for car wheels, are made from ingots of a greater or lesser weight and with a round or square section.

The large ingot stood upon a semi-circular platform, and served as a centre piece for a group of pieces of shafting, highly wrought, for locomotive wheels and tires, for guns and gun carriages, and many other objects of wrought and unwrought steel. Opposite all this was the monster gun, also made of cast steel, weighing fifty tons. It is intended for coast defence against the attacks of iron-clads. It consists of an inner tube upon which are shrunk cast steel rings, which were made like railway tires and without welding. The diameter of the bore is fourteen inches; and as it is a breech-loader, the perfection of the bore and rifling may be seen by looking through the gun at the muzzle. It has forty rifle grooves. This gun was in process of manufacture day and night for sixteen months without interruption. The railways had no cars strong enough to transport it to the Exposition, so the establishment was obliged to construct its own car, which was made entirely out of cast steel and has twelve wheels. It weighs twenty-four tons. The gun is for sale and is valued at one hundred and eight thousand seven hundred and fifty dollars.

Cast steel railway tires form a very considerable portion of the manufacture of this establishment. They make about forty thousand a year, over a third of which are for English, Indian and American railways. They are made out of one piece of steel without welding, and in the following manner: Large ingots are forged out into flat lengths, from which are cut rectangular pieces corresponding with the height of the proposed tire. These pieces are then split down the centre to within a certain distance of each end; wedges are inserted, the slit opened out so that the bar is gradually, under the hammers, converted into a ring, which is at last formed into a tire between powerful rollers.

Among the many other objects worthy of note were the "angle rings" for steam boilers. These are made after the same method as the tires, and are very perfect specimens of machine forging. One, with a diameter of ninety-six inches, weighed four hundred and eighty-three pounds. They are sold at the works at two hundred and twenty-five francs per one hundred kilogrammes, and any size will be made to order. Cast steel railway bars are also one of the chief objects of manufacture of the works. They are made from steel of second quality and are afforded at a comparatively low price—about half as much more as the cost of an

iron rail. The durability is greatly superior. Krupp can now supply such rails at forty francs the kilogramme, but I have heard that there is a new process by which the cost is to be much reduced.

BOCHUM COMPANY—STEEL PRODUCTS.

Next to the exhibition of Krupp, which may be styled as princely, the display made by the Bochum Company of Westphalia, Prussia, was most interesting. This company also make large objects of cast steel, and exhibited railway tires, shafts, axles and some remarkably large bells, one of which is nearly ten feet in diameter and weighs fourteen thousand seven hundred and fifty kilogrammes. One of the most striking objects was a string of railway car wheels, twenty-two in number, all cast together at one operation, the junction being from hub to hub and by one single connecting sprue at the bottom. When they are taken out of the sand they are centred and mounted in a lathe as one piece and then turned up on the edges.

It is claimed by this company that its cast steel wheels will run on an average fifty-seven thousand kilometres without requiring any repair. One of the railway companies certifies that the puddled steel tires suffer a wear of one sixteenth of an inch in running twelve thousand kilometres, while the cast steel wheels of Bochum Company will run thirty-nine thousand two hundred and forty-eight kilometres before they are worn to an equal extent. It would be interesting to know how they compare with our chilled face car wheels.

FRANCE.

The French exhibit of iron and steel was very fine. Their largest steel ingot, however, weighed only twenty-five thousand kilogrammes. It was broken across and showed a very homogeneous fracture. Some of their cast steel tires made without welding, upon Krupp's method, were twelve feet in diameter. A cast steel cannon weighed sixteen tons, and was turned up and polished all over. They showed sheets of rolled cast steel that were twenty-two feet long, six feet wide and half an inch thick. A large part of this display was in a separate building in the Park, and was very complete and extensive.

FORGED IRON.

In forged iron, for ornamental and decorative purposes, the Exposition was very rich. There was a long line of gates and sections of fence placed between the Exposition grounds and the reserved garden. Some of them were beautiful in design, and wonderful in their sharpness and accuracy of finish. The peculiar construction of French dwellings, with an inside court shut out from the public streets or avenues, makes a demand for highly ornamental and somewhat costly entrance gates, which does not exist with us.

ORNAMENTAL CASTINGS.

The use of cast iron for ornamental purposes has evidently made great progress. The substitution of iron for bronze in artistic productions is of comparatively recent date, yet the visitor who saw the results in the Exhibition was compelled to acknowledge that iron will in the future be substituted to a great extent for the alloys of copper, in the production

of large ornamental or monumental works. As an evidence of this, we had the splendid monumental fountain and groups of figures of animals, on one side of the grand entrance to the Park, from the foundries of Durenne, and inside the building extensive displays of statues, busts, vases, stags' heads with antlers, and a variety of tablets and smaller objects. From another establishment there was a splendid series of figures and groups of life size, most of them Scripture subjects for the adornment of churches. One group, for example, represented the Crucifixion, with the Savior and the two thieves of life size. The form and spirit which the sculptor gives to the model was rendered perfectly in the rigid iron. Almost all of these objects were shown as they came from the mould. The surfaces were perfectly smooth and even, and visitors were amazed at the accuracy with which the different parts of the mould were brought together. The suture lines are sometimes hardly visible; again they appear as thin films rising from the surface, so that they may be dressed away without injury to the figure. They are all cast hollow, and the cores were supported by iron rods or wire.

There was no evidence in the Exposition of an extensive application of cast iron to architectural decoration. It is true that the building was in great part made of iron, but there was little attempt at ornamentation. The material does not appear to be used anywhere in Europe as freely and with such fine architectural results as in the United States, and especially in California The railway stations generally are wonderful structures of iron and glass, but there is comparatively little attempt in them at artistic display.

ACCURATE GAUGES.

In the display of ordnance and munitions of war made by Whitworth, of England, there were some very interesting longitudinal sections of guns and rifles, which showed the remarkable perfection of the bore and rifling. This distinguished mechanic is known to produce some of the most accurate of gauges, and a few specimens are shown to illustrate them. A stout steel ring is handed to you through which you can pass a polished steel cylinder about half an inch in diameter. The fit is so perfect that it requires a little pressure to pass the cylinder through from end to end, and this pressure must be applied in the line of the axis; the least pressure upon the sides of the ring appears to bind upon the cylinder. You next take a second cylinder, apparently exactly the same size as the first. This passes through the ring with perfect ease, and, compared with the other, it is a very loose fit. Now the difference in diameter of these two cylinders is the 5-1000th part of an inch. Two perfectly plane surfaces of cast steel were shown. One of these slides about over the other upon a thin film or cushion of air. If by a little effort the air is excluded the plates are inseparable by a direct pull. One may be lifted by the other.

In the same building in which Whitworth's ordnance was shown "John Brown & Co., limited," exhibited a bar of steel, an armor plate, thirty feet long, three feet six inches wide and six inches thick, weighing eleven tons. It was planed as true as a ruler on the edges and ends, and appeared to be compact and homogeneous throughout.

COPPER AND ZINC.

The most attractive display of copper in its raw state was from Lake Superior. The collection consisted of crystallized native copper, and of the various interesting minerals and crystallizations which accompany it. There were also some of the products of smelting and a stack of the metal in ingots of a brilliant red color, like that of the celebrated copper bars of Japan, some of which may be seen in the representation of that Empire. The various copper ores of California were displayed in the same and an adjoining case with the Lake Superior specimens, but were more interesting for their number and variety than for their beauty. The brilliant mass of variegated ores from Plumas County, and the wonderfully rich and pure masses of red oxide of copper from the old Arizona mine, were most admired. Neither Union or Keystone, the Newton and the Cosmopolitan or the Del Norte County mining companies did themselves justice in not sending a complete suite of their different grades of ore. As it is, the few specimens that were in the Exhibition will at least gain the mines a place in the catalogue and a mention, perhaps, in the official reports to the various Governments. A series of specimens from each of our leading California mines, trimmed to a uniform size, say into blocks about eight inches square, would have made an array of rich ores far finer than any other display of copper in the Exposition.

The duty of making an official report to the United States upon the copper of the Exhibition devolves upon Mr. H. Q. D'Aligny, of Lake Superior, a mining engineer and one of the United States Commissioners, who had general direction and care of the mineral department of the United States in the Exposition since the opening. This report, with the others upon other portions of the Exposition, will be made this Winter, and will probably be printed in the Spring at Washington. Although the collection from Lake Superior was quite good, as respects variety, there were no very large masses, and no effort appears to have been made by the mining companies to send any. As a consequence, Russia has the credit of sending the largest mass of native copper, weighing fifteen hundred and sixty pounds. It was sent by Nicolas and Alexander Popoff, from the distant Kirghiz Steppes in Siberia. In this mass the sharp eyesight of Descloizeaux, the distinguished French mineralogist, detected an isolated grain of native silver. This is exceedingly interesting to mineralogists, for it shows the same association of the metals in Siberia as at Lake Superior, and it indicates a similarity in the deposits and in their origin. It is generally known to mineralogists in California, although it may not be a familiar fact, that at Lake Superior large lumps of pure silver are found in the midst of masses of copper, the two metals being as perfectly united as if soldered, yet there is no mingling or alloy at the junction. It is now generally conceded that these metals were deposited from solutions, under the influence of electrical currents. It is quite probable that native silver will be found with the copper of Alaska. I have seen very large masses of copper from that place, and there is every reason to believe that we will find there copper deposits fully equal to those of Lake Superior.

MINES OF PRINCE DEMIDOFF, SIBERIA.

Paul Demidoff, of Siberia, sent a large collection of the products of his various mines of copper, iron, gold and platinum. His property ex-

tends on both slopes of the Ural Mountains, and comprises over a million and a half of acres of mineral and forest lands, with a population of fifty-four thousand persons. In this estate there are twenty-four copper mines, all in operation, one hundred and seven gold veins, and twenty mines of platina. The copper mine of Medno-Roudiansk, discovered in eighteen hundred and fourteen, has yielded nearly a million of pounds of fine copper, and is worked to a depth of five hundred and seventy-four feet. This is the mine that affords the beautiful malachite. This mineral was discovered in eighteen hundred and forty in an enormous mass, and over seventy thousand pounds have been taken from it. The fragment sent to the Exhibition is five or six feet long and nearly three feet thick. It weighs four thousand six hundred and eighty-six pounds, and is valued at fifteen thousand dollars. The portions of this mass which have been polished reveal a very beautiful grain and a fine color.

The Prince has twenty-four copper smelting furnaces on the estate, some of which smelt thirty-five tons of ore in twenty-four hours.

MALACHITE FROM QUEENSLAND.

Another large mass of malachite in the Exhibition was contributed from Queensland, by the Peak Downs Copper Company. This specimen was nearly six feet long, three feet wide and one and a half thick. Its weight was not stated. It is rather dark colored and is not as solid as the specimens from Siberia.

The famous Burra Burra mines of South Australia were not fully represented; but there was an extremely interesting collection of the beautiful blue carbonate crystals associated with malachite.

There were some very fine malachite vases, from one to three feet high, sent from different establishments in Russia, besides paper-weights, inkstands and a variety of small ornamental objects, attractive in appearance and excellent in workmanship.

The English and Australia Copper Company made a good exhibition of their products in bars and slabs of refined copper and ordinary black copper, for which they obtained a bronze medal.

COPPER ORES OF CHILE.

Chile made a very heavy exhibition of copper ores. They were sent in great masses and were piled together in magnificent confusion, with the figure of a miner in full costume standing at one end of the heap as if upon guard. These blocks were chiefly yellow copper ore and the variegated ore, with some gray copper and some masses of cupriferous silver ores. The copper mines are the most important and profitable in Chile and employ the greatest number of workmen, as the following facts will show. There are now in actual working or development one thousand six hundred and sixty-eight copper mines, two hundred and sixty-eight silver mines, six hundred and sixty-eight coal mines, and the total number of miners is twenty-three thousand seven hundred and forty-three. In eighteen hundred and sixty-three there were three hundred and forty-seven high or cupola furnaces for the smelting or fusion of copper ores. The provinces richest in copper and silver ores are those of Atacama and of Serena in the north. They afford nearly three-quarters of the annual production of the country. The most important mines, also, are not far from the coast, and are connected by

railroad with some of the best ports, so that the facilities of transport and exportation are great and comparatively inexpensive. Copper and its ores are, however, not confined to any particular part of the State, but are very generally distributed in the interior along the Andes, from Talco in the south to Majellones in the north, or over a distance of nearly twelve degrees of latitude.

The value of copper and its ores exported from Chile in eighteen hundred and sixty-five was over fourteen million dollars, most of which went to England. A large part of it is sent in the form of matte (concentrated ore by fusion), and some in the form of bars and ingots.

DECADENCE OF THE ENGLISH MINES.

The production of copper ores in Cornwall has been steadily diminishing and now many of the mines are closed, for they can no longer be worked with profit while the price of copper is so low. The mines are in general very deep, and the ores very poor when compared with those of California, Chile and other parts of the world.

There were very few exhibitions of these ores, or from the extensive copper smelting establishments of Great Britain. In one small collection from Swansea I saw samples of our ores from Calaveras County and from the Colorado River.

COPPER SMELTING FURNACES.

There were several extremely interesting collections of copper in its various stages of progress by smelting from the ore up to the refined or rose copper for use. These collections show not only the metal in its various stages, but the fluxes, the scoriæ and the fuel used. They were accompanied by carefully made models of the furnaces employed. The models were so constructed that they could be opened into two portions, and thus not only show the exterior but the interior construction. They are carefully made to a scale and are intended to serve as guides for the erection of large furnaces. They would be of great service to us in California, and I have regretted that the State has no institution provided with a fund which might be applied to the purchase of such models for the benefit of our mining population and the instruction of our young men who are turning their attention to mining and metallurgy.

MANSFIELD COPPER SCHISTS.

The company occupied in the working of the Mansfield copper schists made a fine display of the products of the mines and of their works for the manufacture of sheet copper and copper boilers. The production of the mines in eighteen hundred and sixty-six was not less than twenty-one thousand seven hundred and twelve quintals of rosette copper, and twenty-four thousand five hundred and fifty-four quintals of refined copper. Among the articles of manufactured copper there was a sheet nineteen feet nine inches long and nine feet wide, weighing four and a half pounds to the square foot. Another sheet was ten feet long and three feet wide, and a boiler or kettle eight and a half feet in diameter and three feet deep. It is claimed that the works can turn out copper sheets ten feet wide and thirty feet long. The mines and works of this company give occupation to five thousand five hundred men.

ZINC ORES AND MANUFACTURES.

The principal exhibitions of this metal and its products were made by the Prussian and French companies, foremost of which is the Vielle-Montagne. This company is not exclusively occupied with zinc mines; it owns, also, deposits of lead, iron pyrites and coal. It has establishments in Germany, Belgium, France and Sweden. It employs in all six thousand two hundred and twenty-three workmen, of whom two thousand six hundred and ninety-three are in Belgium. It produces seventy thousand tons of zinc ores annually, two thousand seven hundred tons of lead ores, two thousand tons of copper ores, and one hundred and ten thousand tons of coal. Its manufactures are: metallic zinc, thirty-two thousand tons; sheet zinc, twenty-five thousand tons—besides some eight hundred tons of zinc nails and small articles. The manufacture of zinc-white—the white oxide of zinc—used for painting, has reached the figure of six thousand tons. The sales of the company per annum are, in round numbers, as follows:

Manufactures.	Tons.	Value in francs.
Metallic zinc	35,200	26,400,000
Zinc white	5,800	4,327,500
Ores of lead, etc		1,055,000

The white zinc is made near Paris, by the combustion of the metal, and not directly from the ore, as by the American method. The specimens of ore exposed by the company consist chiefly of blende—the sulphuret of zinc—in large masses weighing from four hundred to eight hundred and one thousand pounds each. This company has a formidable competitor in the Silesian Zinc Company, of Breslau, which was established in eighteen hundred and fifty-three with a capital of five million Prussian thalers, since then increased to ten millions. One of the chief merits which this company claims for its zinc is that it is all made from calamine and not from blende, and is therefore supposed to be free from sulphur and to be stronger and more ductile. There was a very fine show of zinc plates, corrugated sheets for roofs, perforated plates, nails, wire and tubes. The largest plate was seventeen feet long and fifty-four inches wide, and three quarters of an inch thick, and it weighed two thousand and one hundred pounds. It could have been made twice as long and heavy, if the space had been allowed for it. The new Exchange building at Berlin is roofed with the corrugated zinc plates of this company's manufacture.

AMERICAN ZINC.

But in all the zinc exhibited by these two companies, and several others, there was none equal in quality to that produced by Wharton from the ores of Lehigh County, Pennsylvania, and exhibited by him in the American section. This zinc is nearly chemically pure, and may be used as such in analysis when testing for arsenic.

The New Jersey Zinc Company, of New York, was represented there by samples of the ores from the mines of Sterling Hill and Franklin, New Jersey, and by the products of the works at Newark. These con-

sisted chiefly of white zinc, dry and ground in oil for paint, and of the hard white, manganiferous iron, generally known as "Franklinite" iron. This industry of zinc and iron combined has assumed large proportions and is very successful. It was founded chiefly through the exertions and enthusiasm of James L. Curtis, of the City of New York, who early had a correct appreciation of the importance and value of these ores and of zinc oxide for paint as compared with poisonous lead, long before the incredulous public could be convinced.

I do not know of any extensive deposits of calamine in California. There are some localities of blende, but it is not probable that they can be worked to advantage for several years to come.

NICKEL AND COBALT.

Information in regard to the ores of these metals and the products manufactured from them is of some special interest to California, inasmuch as we have a locality of such ores in abundance at or near the top of the Sierra Nevada. These were represented in the collection by the specimens given by Mr. Gaskill.

There were numerous exhibitions of nickel and its ores from various and remote parts of the world. We found specimens from Chile, from Italy, Prussia, Sweden, Austria; also from New Jersey. From the last named locality Messrs. Wharton and Fleitman sent specimens of matte, containing about twelve per cent. of nickel, and some of the ordinary commercial nickel in small cubes, containing seventy-five per cent. of nickel and twenty-five per cent. of copper. This is produced from nickeliferous pyrrhotine (magnetic pyrites) and the sulphuret of nickel; which last occurs in crusts at the Gap mine in Pennsylvania. The pyrites are said to contain only about three per cent of nickel.

The Swedish nickel is produced at Klepwa. This ore is also a mixture of nickeliferous pyrrhotine with ordinary copper pyrites, and is shown in large masses. It appears to be taken from heavy beds. The best ore shows by analysis only 2.75 per cent. of nickel and 0.10 of cobalt. The concentrated matte contains 53.74 per cent. of nickel and 25.46 of copper. The small cubes contain sixty-six per cent. of nickel and thirty-four of copper. Another quality contains seventy-two per cent. of nickel. The establishment produces annually eighty-five thousand kilogrammes of concentrated nickel matte, containing from fifty-three to fifty-six per cent. of nickel and twenty-four to twenty-seven per cent. of copper, seven per cent. of iron and thirteen per cent. of sulphur.

The price of the products varies according to the percentage of nickel. The ordinary matte, containing from fifty to fifty-six per cent. of nickel, is worth 6.70 francs the kilogramme of nickel. For example, one hundred kilogrammes of matte of fifty-four per cent. is worth about three hundred and sixty-two francs. For a sixty per cent. matte the price is about five hundred and four francs for one hundred kilogrammes.

There is another establishment for the production of nickel at Sagmyra, Falun, and it was represented by specimens of ore and the mattes of various degrees of value. Some of the ore is a granular mixture of hornblende with magnetic and copper pyrites, very much like some mixtures in the United States. The best product of these works that was shown is a finely granular matte containing sixty-one per cent. of nickel, thirty-eight per cent. of copper and 0.80 per cent. of iron.

A cobalt and nickel company in Hungary exports a crude product

containing forty-eight per cent. of nickel and cobalt, to England, to the extent of one million kilogrammes a year (about twenty-two hundred tons).

A nickel and cobalt manufacturing establishment at Val-Benoit, near Liege, exhibited its products and sells them at the following prices:

Per kilogramme.	Francs.
Pure nickel	13.00
Ordinary melted nickel	11.50
Black oxide of cobalt	38.00
Rose oxide of cobalt	25.00
Nickel bronze	5.50

In Chile the ores of cobalt are common from the mines of Volcan, in the Province of Santiago, to the north of the Desert of Atacama. It accompanies the copper and the silver ores. At the mine of Buitre, gray cobalt ore is associated with mispickel, etc. Considerable quantities have been exported in the raw state, and the ore is washed in Europe. Danaite, mispickel containing cobalt, is found at San José, Santiago. It is a fibrous variety and contains four per cent. of cobalt. Gray cobalt is found at the same locality; it contains twenty-one per cent. of cobalt.

QUICKSILVER.

The finest display of ores and the metal was made by the Old Almaden Mine of Spain. It sent twenty or thirty solid blocks of cinnabar more than a foot square. This ore is of finer grain than that from New Almaden, but the color is not so brilliant. The Old Almaden ore looks more like the red oxide of iron. A large flask of native quicksilver accompanied the collection.

Algeria sent some very large masses of ore in which the cinnabar is associated with carbonate of lime, very much as in the California mines. This association appears to be as characteristic of cinnabar as that of quartz with gold.

Most of the California localities were represented, but not by large and brilliant specimens.

Old Almaden Mine is worked in a very rude manner, and one of the most ancient single-action steam engines is still in operation there raising water.

LEAD ORES.

The lead ores exhibited were chiefly the sulphuret-galena, and the most extensive displays were in the French, Algerian and Italian sections. Some very large blocks of granular galena were shown from Sardinia, and an interesting series of specimens, showing the ore in the various stages of mechanical preparation—washing and sorting—was exhibited in the English section. As, however, most of these ores are argentiferous, they are noticed more in detail in the succeeding chapter.

One of the great curiosities of lead manufacture was shown in the French section, by M. Letrange, being a coil of lead pipe twenty-eight hundred and fifty metres long (nearly ninety-five hundred feet) with a calibre of only one millimetre (about one twenty-seventh part of an inch).

CHAPTER IV.

GOLD, SILVER, PLATINUM AND THE RARE METALS.

GOLD AND ITS ORES—CALIFORNIA.

The principal mines of California were represented in the collection, as will be seen by reference to the appended catalogue. Although the collection was not as extensive and rich as it should have been, it was very interesting and instructive, and was highly commended for the uniformity of the specimens in size and for the arrangement. The collection sent by Dr. Pigné was also very complete and well classified, and contained specimens from some mines not otherwise represented. Nearly every variety of gold-bearing quartz was shown and generally the different varieties from the same vein, together with specimens of the wall rocks and of the surface or decomposed ore. Most of the specimens were selected so as to show the average character and appearance of the ore as raised and sent to the mills, and thus the display of free gold was not as striking and rich as some persons expected to see. In general, those who visited the California display looked for quantities of gold in nuggets and for trays full of the dust. This would have been very attractive to the crowd, and would have assured people of the already familiar fact—that gold abounds in California. The collection, therefore, was much more valuable and instructive than a great show of gold could have been, and it excited considerable interest and attention. The contrast between the California ores and those from Colorado, arranged in a large case opposite, was very striking—the California specimens being nearly all quite white and showing but little sulphuret of iron, while the Colorado specimens were nearly all of them sulphuret of iron without quartz.

The collection of gold crystals from California belonging to the Commissioner was privately exhibited to the mineralogists and those who could best appreciate them, and they excited great admiration. There is nothing comparable with them, for variety and beauty, in the museums and collections of Europe.

The large crystalline mass of gold from the Spanish Dry Diggings,

California, which was exhibited for a time at San Francisco, in the window of Hickok & Spear, and was photographed by Watkins, is now in Paris, the property of M. Fricot, formerly the owner of the Eureka mine at Grass Valley. Owing to the difficulty and expense of making this unique specimen perfectly safe in the Exposition, it was not entered there, but M. Fricot took pleasure in showing it freely at his house to those most interested.

COLORADO GOLD ORES.

Mr. J. P. Whitney, of Boston, Commissioner from Colorado Territory, made a large display of the auriferous ores of Colorado. They occupied a long wall case, opposite to the central case in which the California collection was displayed, and the contrast between the two collections was very striking. The Colorado ores are nearly all sulphurets of iron, and quartz does not appear. They made a brilliant, sparkling display, and some of the specimens contained considerable quantities of gold visible to the unassisted eye, but in general the value is only to be known by assays. Mr. Whitney published a pamphlet, with maps descriptive of the Territory, in three languages, and distributed copies liberally. The collection was made much more interesting to the public by this means, and it attracted the attention of French capitalists to the Territory.

The principal mining in veins for gold has been in the counties of Gilpin and Clear Creek. The veins traverse granite, and are seldom over four or five feet thick. They appear on the surface by a discoloration of the soil and a spongy quartz. Considerable gold is extracted from these decomposed outcrops by sluicing. As the veins are opened and worked the decomposed ores are gradually replaced by solid sulphurets of iron and copper, which in some few cases pay for working in the raw state, but in general require smelting. The process now adopted as the best, is to smelt the ores roughly so as to obtain a cupriferous matte, which holds the gold also. This matte is then sent across the Plains to the Atlantic Coast, and shipped to Swansea for the separation of the metals. This of course entails a great expense for transportation, but it is said to be profitable and several furnaces have been erected during the past year. Some of the ores which yielded only ten or fifteen dollars per ton by stamping and pans in Colorado, yielded two hundred and three hundred dollars per ton by the methods at Swansea. Some of the matte contains thirty per cent. or more of copper, and as this metal is saved at Swansea, it alone more than pays the costs of transportation, and perhaps of separation.

AUSTRALIA.

The representation of the extensive gold regions of the Australian Continent were quite meagre and by no means worthy of the country. No organized effort appears to have been made, and the opportunity to show the nature of their ores and to make direct comparisons between them and those of other gold regions has been lost. There were a few desultory specimens of quartz, and some of them closely resembled some of the specimens in the California collection from Amador and Mariposa Counties. One specimen was interesting for the close association of gold and sulphuret of antimony, which has not been observed in California. There were several varieties of placer gold in trays and a few ingots, but there was no peculiar interest attaching to them.

A model of the celebrated "Welcome Nugget," in plaster and gilt, was shown, and was almost as good to exhibit as the original, which was worth about fifty thousand dollars. It weighed a little over two thousand two hundred ounces.

The total gold product of Victoria was very effectively shown by a tall gilded pyramid, which represented the bulk of the gold which was taken out of the mines from eighteen hundred and fifty-one to eighteen hundred and sixty-six. This pyramid was ten feet square at the base, and sixty-two feet five and one half inches high; its bulk was two thousand and eighty-one and one-half cubic feet. It represented the gross weight of thirty-six million five hundred and fourteen thousand three hundred and sixty-one ounces, or one thousand one hundred and seventeen tons, fifteen hundred-weight, two quarters and twenty-six pounds, and valued at one hundred and forty-six million fifty-seven thousand four hundred and forty-four pounds sterling. The pyramid was made in sections placed one upon another. A framework was covered with boards and these covered with stout canvas, the surface of which was studded with bits of plaster and pebbles to represent the grains and lumps of gold. The gilding gave a uniform gold surface and the effect was very good. A similar pyramid could have been sent from California at a very moderate cost.

But the meagreness of the Australian display of ores was redeemed to a great extent by the publication of valuable statistics of the yield of the placers, and the number and the production of the quartz mines. There were also valuable pamphlets and prize essays upon Australian vegetation, agricultural capabilities and the climate.

From the mineral statistics of Victoria for the year eighteen hundred and sixty-six, it appears that the number of quartz miners employed in the different districts was as follows:

Districts.	Quartz Miners.
Ballarat	2,005
Beechworth	2,941
Sandhurst	4,118
Maryborough	2,292
Castlemaine	2,648
Ararat	874
Total	14,878

There were four hundred and eighty alluvial mining engines, with an aggregate horse power of nine thousand nine hundred and eighty-one, and five hundred and ten quartz mining engines, with an aggregate of nine thousand two hundred and thirty-one horse power. The number of stamps was five thousand four hundred and thirty-seven.

The following shows the number of tons of quartz crushed (as far as the exact returns had been received) and the average yield per ton. The price paid for treating quartz varied from four shillings to one pound ten shillings per ton:

Mining Districts.	Tons Crushed.	Produce.		Yield per ton.	
		Ozs.	Dwt.	Dwt.	Grs.
Ballarat	238,503 1-2	58,157	3	4	21.0
Beechworth	130,519 11-20	118,495	19	18	3.7
Sandhurst	244,807 1-2	118,743	10	9	16.8
Maryborough	79,552 3-5	44,967	14	11	7.3
Castlemaine	124,374 1-2	85,662	3	13	18.5
Ararat	43,711	33,868	18	15	11·9
Totals	861,468 13-20	459,895	7	10	16.2

This shows an average of ten pennyweights and sixteen grains per ton, or about ten dollars. Of the total gold exported, the ratio of the gold from quartz veins to that from alluvial deposits was nearly as follows:

Where obtained.	Ounces.
From quartz veins	521,017
From alluvial deposits	958,177
Total	1,479,194

QUEENSLAND AND NOVA SCOTIA.

There were several nuggets of gold from Queensland, the heaviest weighing eighty-four ounces. The quartz veins of Nova Scotia were represented by numerous specimens, some of them quite rich in coarse gold. The quartz is remarkable for its peculiar resinous and glassy lustre, and the gold is remarkably yellow and of superior fineness.

BRAZIL.

The interesting gold region of Brazil was represented by a few specimens, arranged with the diamonds, amethystine quartz, crystals, topazes and other interesting minerals of the country, in a glass case. The principal mine now worked is the Morro Velho, belonging to the St. John d'El Rey Company of England. This is probably the most productive and profitable gold mine in the world. The net paid up capital was one hundred and twenty-eight thousand four hundred pounds, and there has been paid out in dividends seven hundred and fifty-six thousand two hundred and forty-five pounds, besides an additional amount in improvements, which carry the profits up to one million seven thousand four hundred and ninety-four pounds, or about five million dollars.

The total value of the precious metals extracted from the mine has been two millions nine hundred and two thousand four hundred and eighty pounds, and the whole amount of mineral raised has been one million seven hundred and sixty-nine thousand and fifty tons, making the average yield per ton about half an ounce troy, or about eight dollars, the gold containing considerable silver.

DISPLAY OF GOLD FROM OTHER COUNTRIES.

The gold of Canada, Chile, Austria, Japan and other regions was shown, but there was no striking peculiarity in the displays. There were some interesting specimens from Italy, and it appears that several mines are now being worked there successfully by English companies. Some beautiful and very coarse placer gold was shown from Roumania, but no information in regard to the deposits could be procured.

In Russia, the gold fields have an enormous extent along the Altai Range, from the Urals eastward to the Amoor, and even to the Pacific Coast. According to the statistics published by the Russian Government to accompany the specimens exhibited at the Exhibition, the best washings are in the district of Olekminsk, of Bargousinsk, and of Tlatooust; those of the Altai are next in order. The total value of the gold production, upon the price established by the Crown, which buys nearly all the product of the washings, is nineteen million three hundred and seven thousand one hundred and twelve roubles, about seventy-seven million two hundred and twenty-eight thousand four hundred and forty-eight francs annually. This is between fifteen and sixteen million of dollars, and it has been about the production since eighteen hundred and fifty.

A very interesting exhibition of native gold was made by Messrs. Johnson, Matthey & Co, of London, large manufacturers of platinum apparatus for the use of chemists and chemical manufacturers. This firm filled two large glass cases in the English section with samples of its various products, both raw and manufactured. One case was devoted almost exclusively to a collection of native gold, and gold in ingots, in plate and in foil, together with an imposing array of bars of silver from various parts of the world, but particularly from Nevada and Chile.

The collection of native gold contained samples from most of the gold-producing countries, and was formed chiefly of river or scale gold, and thus presented a great uniformity in its appearance. The samples were very neatly arranged in flat-topped show-bottles, and the exhibit was interesting chiefly for the number of localities represented. Most of the large ingots are only models; but having exactly the form and appearance of the originals, very few persons were aware of the fact.

SILVER AND ORES OF SILVER.

The silver ores from the region of Austin and Eastern Nevada, brought by Colonel Buel, formed the last addition to the mineral display of the United States. It was by far the most important contribution of silver ores in the Exhibition, and with the large masses of rich ore from the Poorman Lode, Idaho, and the beautiful mass of dark-colored silver ore from Blind Springs, California, it made an array of which the silver miners of the Pacific Coast may well be proud, although they did not show specimens of half of the well known lodes. The Comstock Lode was not represented in Colonel Buel's collection, but fortunately there were

a few specimens in Dr. Pigné's collection and in that sent by the writer, so that it was possible to show the character of the ores to those most interested, and to make some comparisons. There were many inquiries for specimens of the Comstock ores, and many Californians were surprised that it was not more extensively and appropriately represented. There was a great demand also for information and statistics, and the edition of the little book which Colonel Buel published upon Eastern Nevada was soon exhausted. This was prepared by Myron Angel, of Nevada, for the Committee, and was accompanied by a map showing the various mining districts around Austin and north and south of it.

A suite of specimens of the ores from Eastern Nevada, sent to the Imperial School of Mines, was assayed and yielded in silver at the rate of sixty-seven dollars to five thousand dollars per ton of silver and gold, as will be seen from the appended results. The Imperial Commission awarded a silver medal for this collection, and it will doubtless receive an appropriate notice in the official report to the French Government.

The original and the translation of the following table of results of assays are given as published and circulated at the Exposition:

EXTRAIT DES REGISTRES

DU

BUREAU D'ESSAI POUR LES SUBSTANCES MINÉRALES.

PARIS, le 1er août 1867.

ONZE MINERAIS D'ARGENT, PROVENANT D'AUSTIN-NEVADA, REMIS PAR M. GRUNER, INSPECTEUR GÉNÉRAL DES MINES.

1. HIGHBRIDGE MINE.—Cuivre gris avec cuivre sulfuré et altérations de cuivre carboné vert et bleu, mouches de blende sur quartz ferrugineux.

Argent 0|0.....4.535
Or 0|0.....0.000

2. TRANSYLVANIA MINE.—Cuivre sulfuré avec cuivre carbonaté vert et bleu; mouches de blende et de galène cuivre gris et mispickel sur quartz ferrugineux.

Argent 0|0.....1.405
Or 0|0.....0.000

3. VANDERBILT MINE.—Sylver Peak et Red Mountain Co, étiquette Pocotillo.—Quartz imprégné de cuivre gris avec altération de cuivre carbonaté vert et bleu. Fer oxydé hydraté jaune, mouches de galène et peut-être argent sulfuré.

Argent 0|0.....2.370
Or 0|0.....0.008

4. FISHERMAN LEDGE.—Bullion Co Reveille, District.—Quartz imprégné d'altérations cuivreuses, faibles mouches de galène et de blende.

Argent 0|0.....4.545
Or 0|0.....0.0005

5. CHASE MINE.—Yankee Blade.—Roche quartzuse grise imprégné d'argent sulfuré, d'argent natif, d'argent gris, de cuivre gris avec cuivre pyriteux.

Argent 0|0.....6.250
Or 0|0.....0.00025

6. GREAT EASTERN MINE.—Argent gris, argent rouge, peut-être argent, sulfuré, cuivre pyriteux en grains cristallins très-petits, pyrite de fer, mouches de galène sur quartz.

Argent 0|0.....9.280
Or 0|0.....0.00250

7. FLORIDA MINE.—Argent gris avec argent rouge sur quartz.

Argent 0|0.....11.170
Or 0|0.....0.0005

8. TIMOKE MINE.—Argent gris avec argent rouge et cuivre gris sur quartz.

Argent 0|0.....14.100
Or 0|0.....0.001

9. MANHATTAN MINE.—North Star Mine.—Argent rouge, argent gris avec mouches de pyrite de fer sur quartz.

Argent 0|0.....4.710
Or 0|0.....0.0005

10. DIANA MINE.—Cuivre gris avec pyrite de fer et de cuivre, mouches de galène sur quartz avec un peu de feldspath rose.

Argent 0|0.....6.930
Or 0|0.....0.000

11. FAIRMOUNT MINE.—Twin River.—Galène à facettes curvilignes, cuivre gris, mispickel, mouches de blende sur quartz.

Argent 0|0.....0.180
Or 0|0.....0.00025

L'Ingénieur en Chef des Mines
Directeur du Bureau des Essais,

L.-E. RIVOT.

EXTRACT FROM THE REGISTER

OF THE

BUREAU OF ASSAY OF MINERALS.

PARIS, August 1st, 1867.

ELEVEN SPECIMENS OF SILVER ORE COMING FROM AUSTIN, NEVADA, U. S., RECEIVED FROM MR. GRUNER, INSPECTOR-GENERAL OF THE MINES OF FRANCE.

1. HIGHBRIDGE MINE.—Gray copper with sulphuret of copper and altered blue and green carbonate of copper, speckled with blende on ferruginous quartz.

Assay of silver per ton of 2,000 lbs.....$1,709.68

2. TRANSYLVANIA MINE.—Sulphuret of copper with blue and green carbonate of copper and mispickel on ferruginous quartz.

Assay in silver per ton of 2,000 lbs.....$2,794.50

3. VANDERBILT MINE.—Silver Peak and Red Mountain.—Quartz, impregnated with gray copper, with altered green and blue, carbonate of copper, yellow hydrated oxide of iron, specks of galena and perhaps sulphuret of silver.

Assay in silver per ton of 2,000 lbs.....$687.30

4. FISHERMAN LEDGE.—Bullion Company, Reveille District.—Quartz, impregnated with altered copper, small specks of galena and blende.

Assay in silver per ton of 2,000 lbs.....$1,713.46

5. CHASE MINE.—Yankee Blade.—Gray quartz rock, impregnated with sulphuret of silver, native silver, gray silver and gray copper, with copper pyrites.

Assay in silver per ton of 2,000 lbs.....$2,356.50

6. GREAT EASTERN MINE.—Gray silver, ruby silver, perhaps sulphuret of silver, gray copper, copper pyrites in very small crystalline grains, iron pyrites, specks of galena on quartz.

Assay in silver per ton of 2,000 lbs.....$3,498.50

7. FLORIDA MINE.—Gray silver, with ruby silver and gray copper on quartz.

Assay in silver per ton of 2,000 lbs.....$4,211.09

8. TIMOKE MINE.—Gray silver, with ruby silver and gray copper on quartz.

Assay in silver per ton of 2,000 lbs.....$5,349.63

9. MANHATTAN MINE.—North Star Mine.—Ruby silver, gray silver, with specks of iron pyrites on quartz.

Assay in silver per ton of 2,000 lbs.....$1,365.90

10. DIANA MINE.—Gray copper with iron and copper pyrites, specks of galena on quartz, with a little rose-colored feldspar.

Assay in silver per ton of 2,000 lbs.....$2,612.61

11. FAIRMOUNT MINE.—Twin River.—Galena with curvelinear faces, gray copper, mispickel, specks of blende on quartz.

Assay in silver per ton of 2,000 lbs.....$67.86

Chief Engineer of Mines and
Director of Bureau of Assay,

L.-E. RIVOT.

IDAHO—THE POORMAN ORE.

The New York company which now owns and works the Poorman lode sent over in good season several very large and wonderfully rich masses of the ore. One of them weighed about two hundred pounds, and consisted in great part of red silver ore. It has occupied the top of a great pile of ores from the United States, and for a long time was hardly noticed by even experts as an object of any great consequence. It was only necessary, however, to look closely to see the massive ruby silver and crusts of chloride. The Jury awarded a gold medal to Mr. Walbridge for this display.

THE BLIND SPRING ORE.

The very fine specimen sent by Dr. Harkness and Dr. Frey, of Sacramento, attracted some attention from the mineralogists by reason of its richness in silver, and because it contains some of the compound called Partzite, and supposed to be a new mineral. It was the general opinion, however, that the mineral is not sufficiently well characterized to be regarded as a distinct species. It is probably a mixture of other minerals, and has not a constant composition.

KONSBERG SILVER MINES, NORWAY.

As regards beauty of specimens and mineralogical interest, there was nothing so fine as the exhibit made by the Norwegian Government of the products of the Konsberg mines. A glass case was filled with the most extraordinary crystallizations of native silver and of the sulphuret. This silver is remarkably white and contains a little quicksilver naturally alloyed with it. This collection was a very complete one, as regards the associate minerals and rocks, and was accompanied by several colored sections of the veins and galleries of the mine.

CHILE SILVER MINES.

There was a very important collection of the silver ores of Chile. Some specimens of the ruby silver in crystals from Chañarcillo were remarkably fine. There were also some specimens of the rare compounds of silver, such as amalgam crystals, the chloro-bromide of silver, and a new mineral (a double iodide of silver and of mercury) called *tocornalite*, by M. Domeyko, Professor in the School of Mines at Santiago, who sent a short memoir with the collection. According to this author, the silver veins of Chile, such as those of Trés Puntas, Chañarcillo, Agua Amarga, are found in an argillaceous limestone formation, often fossiliferous, and belonging to the Jurassic epoch. These mines are further from the coast than the rich copper deposits.

The exportations of silver from Chile for the last five years have averaged about thirty-three thousand and eighty-six kilogrammes, exclusive of the metal contained in the mattes of argentiferous copper and the unworked ores. The silver coinage in eighteen hundred and sixty-six amounted to nine hundred and seventy-three thousand four hundred and twenty-eight dollars, in pieces of fifty, twenty, ten and five centimes. An interesting collection of ores illustrated the process of treatment of argentiferous copper ores by fusion to obtain a rich matte for exporta-

tion. These mattes contain fifty-six per cent. of copper and two hundred and forty-one thousandths of silver. The scoriæ which result from the smelting ordinarily retain two thousandths of copper and five ten-thousandths of silver.

SILVER MINES OF FREIBERG, SAXONY.

The Freiberg mining region was well represented in the Exposition by a careful selection of the ores of the different formations, accompanied by their products. As the writer visited these mines, he is able to present some of the following details from personal observation:

There is a tradition, generally believed, that the veins of Freiberg were discovered by a teamster named Goslar, in the twelfth century. This recalls at once the recollection of the discovery of the Austin silver mines by the rider of the Pony Express, and it is singular that the ores of Austin and those of Freiberg are in some respects similar. In eighteen hundred and twenty-five, the now venerable Professor Breithaupt made a calculation which showed that in six hundred and forty years the Freiberg mines had produced eighty-two thousand quintals of silver, worth two hundred and forty million of thalers.

Freiberg is only one of the mining centres of Saxony. The ore bearing or metalliferous region is divided into four mining districts, as follows: Altenberg, thirty-one mines; Freiberg, ninety-eight; Marienberg, forty-eight; Schwarzenberg, one hundred and forty-six. This shows a total of three hundred and twenty-three mines in the four districts. Of these mines only twenty are worked by the Government; the others are explored by companies and private capital. The total number of miners in the district is set down in the Government reports as ten thousand one hundred and twenty-two, and the number of smelters or laborers at the reduction works as one thousand one hundred and seventy-five.

In the year eighteen hundred and sixty-five the amount of first class ore delivered at the Freiberg smelting works was about thirty-three thousand six hundred and fourteen tons, worth one million, seventeen thousand three hundred and five dollars (in its raw state), or thirty dollars a ton. These ores when worked gave products to the value of about two million dollars. The principal products, and in the order of their value, are silver, lead and its oxides, sulphate of copper, sulphuric acid, gold, zinc, nickel, bismuth and arsenic. The amounts are given in round numbers, on account of the difficulty in calculating the different German weights and values.

The products of the Freiberg smelting works are derived not only from the ores of Freiberg, but from those of other districts, and also from distant places. Some ores are received there from South America and Mexico; those from the latter places being chiefly antimonial ores, and sent as ballast at a small cost for freight. The whole quantity of foreign ores is, however, inconsiderable, compared with those of the region.

There are three or more groups or systems of veins, having different directions and intersections at various angles. A copy of the official map of the region shows veins running parallel with each other and in close proximity. They are regarded as separate, though usually worked under one company or administration. They are quite different from our Comstock lode, being in general quite narrow compared with it, and without such remarkably well formed selvages or clay walls. I told one

of the Professors of the costly litigation we had had in Nevada upon the question of one or more ledges, and he remarked that formerly there had been similar and protracted disputes in Freiberg, until finding it impossible to settle the question satisfactorily, the laws had been changed so as to make the claims square; in other words, they adopted the plan of square locations.

The mining laws require the finder of a vein to obtain a permit to work it from the Government, and to have it recorded in the Government office. Each claim is divided into one hundred and twenty-four shares, of which one belongs to the discoverer, one to the owner of the land, and two to the town. These four shares are unassessable, so that the whole expense of development or improvement falls upon the outside holders. Owners of stock have the option of giving up their shares to avoid the payment of an assessment. In this case the shares fall into the hands of the Mining Office, and are sold to the highest bidder, preference usually being given to the old stockholders. The "freeze out game" seems to have been practiced here for a long time, for the large and wealthy companies gradually absorb the smaller ones. Of all these mines there are only six that pay dividends regularly, while there are several that just make expenses and continue to develop without assessing. There is one mine that regularly assesses the stockholders twenty-five dollars per share quarterly. The Himmelfahrt mine and the Himmelfurst are two of the most extensive in the vicinity of Freiberg. The former paid seven hundred thalers per share last year, and the shares now command from eight thousand dollars to ten thousand dollars each; forty years ago they could have been bought for eleven cents a share. The Himmelfahrt paid six thalers a share last year. The mines are now producing better than they have for years previously. It is said on good authority that the establishments here, including the reduction works, give in the aggregate a profit of eight to ten per cent. per annum upon the investment.

The Himmelfahrt is one of the most extensive and deepest of the mines. Its shafts are just outside of the old walls of the city, and they have been carried to the depth of nearly two thousand feet. The length of the galleries is reckoned in miles, and portions of them extend under the town. They form a complete labyrinth, and many are so little frequented that a stranger might easily get lost and perish, perhaps, of starvation, before finding an exit.

It was very interesting to walk through the ancient workings, where the galleries had been cut by pick and gad alone, without the aid of gunpowder. They are very narrow, but are high, with the top roundly arched, and all very smoothly cut. They reminded me at once of the galleries in the Japanese mines, cut in a similar manner. One of these galleries led to a place where two tablets, carved out of the solid walls, bear the date of seventeen hundred and sixty-seven and inscriptions noting the fact that powder was first used in the mine near that spot. To descend to the depth of two thousand feet, and ascend, is no small journey, and exhausts a great part of a miner's strength. To avoid this the deep shafts are fitted with the well-known man machine, or *fahrkunst*, by which the trip can be accomplished with comparatively little fatigue. In this mine the man machine and pumps are operated by water wheels about thirty feet in diameter, which are placed in large chambers excavated far below the surface. The water is brought in by a gallery, and after passing over the wheels escapes by the adit. The hoisting is performed by the same power, transmitted by wire cable to

the surface. Steam is used at other shafts. The engines are generally horizontal, provided with link motion, and are connected with the bobbin shaft by gearing. The friction band operates upon the periphery of the flywheel, which is better than our system. Their bobbins and pulleys at the head of the shaft are generally of good size—not less than eight or ten feet in diameter—and are double, so that while one cage or skip is descending the other is ascending. Round iron cable is used exclusively. No person is allowed to ascend or descend in the skip or car.

Most of the veins are without gouge or selvage, and all the ore must be blasted out. I was surprised at the small size and lightness of the German drills. A California miner would hardly consent to use them after handling our octagonal steel drills.

The ores of Freiburg are taken to smelting works situated in a deep basin-like valley, upon the Mulde, where there are hundreds of furnaces in constant operation. The ores which were formerly treated by amalgamation in barrels are now treated by fire, and the silver is gradually concentrated into metallic lead, from which it is separated by Pattimon's process. Almost all the constituents of the ores are utilized. Amongst them are lead, zinc, copper, silver, gold, arsenic, cobalt, sulphur, sulphuric acid, sulphate of copper, orpiment and realgar.

There are about forty students in the Academy from the United States, including six from California, or in all about half of the total number of students.

The country rock of the Freiberg veins is a hard tough gneiss—in fact, the typical gneiss—which is evidently a metamorphosed sedimentary formation, and is in many places nearly horizontal. The veins cut across it, and are, for the most part, nearly vertical. They make very little show at the surface, for there is no heavy gangue or veinstone of quartz, as with most of our mineral veins. The outcrops are generally very rusty and red, and thus indicate at once the pyritiferous character of the ores below. The ore is generally a mixture of iron and copper pyrites, with arsenical pyrites, galena, blende, and here and there the silver sulphurets. Occasionally very beautiful crystallizations of the silver minerals are found, and the cabinet of the Mining Academy is enriched by them. It contains a magnificent collection of these ores and crystals taken from the different veins for one hundred years past. Now and then considerable quantities of native silver are found. In four years, from eighteen hundred and fifty-seven to eighteen hundred and sixty-one, eight thousand three hundred pounds of this metal were taken out of the Himmelfurst mine, most of it in large plates, one of which weighed four hundred pounds.

A mine called the Chur Prinz, a few miles from Freiberg, belongs to the Government, and is kept as a sort of experimental mine, where new inventions and processes are tried at the public expense. Two of Blake's ore breakers are used here to prepare the ore for the jigs and other concentrators. The ore passes from one breaker to the other, the last being adjusted to crush fine.

The stamping mills are very rude and do not compare favorably with ours for efficiency and economy of power. The total number of stamps about Freiberg is six hundred and fifty-six; of these five hundred and seven are dry stamps, and one hundred and forty-nine wet.

Water is raised from the deep mines, not by water power alone, but also by Cornish steam engines at some places, and by the column of water, or "water-pressure engines" in others. Some of these latter are

very perfect and interesting in their operation. Two long tunnels have been projected for the drainage of these mines. One of them is in progress. It will be about eight miles long, and will require many years yet for its completion. It is worked upon at several different points by means of shafts. The other tunnel has been surveyed and talked about, and is intended to be no less than twenty-eight miles long, but the money to construct it has not been obtained, and it is not probable that it will ever be commenced. The developments made by the other tunnel in the ground outside of the belt of the veins have not been of a nature to encourage a hope that the lower tunnel would cut or discover new veins. During eighteen hundred and sixty-five, the whole number of men employed in the tunnel was two hundred and twenty, and the costs for the year was seventy-eight thousand five hundred and ninety-nine thalers.

A few facts upon the rate of wages in Saxon mines may be interesting to California miners:

For eight hours work a miner receives about twenty cents (gold); an under superintendent thirty to thirty-seven cents, and a superintendent about four hundred dollars a year. Boys receive from ten to fifteen cents, and carpenters about the same. One tenth part of the wages is retained for a common fund devoted to the support of indigent miners.

There is a feature in a German miner's life which will seem very odd to most Californians. Every day before the men enter the mine they meet in a chapel at the mouth of the shaft and have a short religious service. Passages of Scripture and prayers are read, psalms are sung, in which they all join. After this the roll is called by the sub-superintendent, and the orders for the shift are given. The miners appear to enjoy good health, and to be contented and happy. They lead a quiet and simple life, and are full of good will towards others. This is expressed in the "*Gluckauf*," or "luck to you," with which you are greeted on coming or going.

SILVER LEAD ORES.

The largest mass of silver in the Exhibition was in the French department, and was extracted from argentiferous lead ores by one of the silver lead companies of Pontgibaud. It is just as it came from the cupel, and is nearly one yard in breadth, and is valued at twenty-seven thousand dollars. It is accompanied by interesting samples of the ores of lead, rough and dressed, and the products of the smelting and cupellation. These are all tastefully arranged in a large glass case, together with large pigs of commercial lead and samples of pipe and sheets. The following is the amount of lead and of silver in several of the ores which are treated at this establishment, in one thousand parts:

Pzaual—	
Lead	620.
Silver	2.450
Roure—	
Lead	287.50
Silver	1.087

Lagrange—	
Lead	272.50
Silver	1.087
Brousse—	
Lead	730.
Silver	3.60

The rich lead in bars contains 0.017 of silver, and the working lead 3.857.

The lead mines of Argentiere exhibited a large mass of granular galena and calcareous gangue, containing, of lead forty-three per cent.; and of silver, one hundred and forty-four grammes per one hundred kilogrammes of ore—four hundred and thirty-five grammes per one hundred kilogrammes of lead.

The following assays show the average quality of the ores:

First quality—	
Lead	45 per cent.
Silver	200 grammes per 100 kilogrammes of ore.
	444 grammes per 100 kilogrammes of lead.
Second quality—	
Lead	40 per cent.
Silver	174 grammes per 100 kilogrammes of ore.
	434 grammes per 100 kilogrammes of lead.
Third quality—	
Lead	38 per cent.
Silver	163 grammes per 100 kilogrammes of ore.
	430 grammes per 100 kilogrammes of lead.

The argentiferous lead ores of Gennamari and Ingurtosu, Sardinia, were also exhibited in the French section. The ore is in large masses and is rather fibrous in structure, but breaks with a brilliant sparkling fracture. Some specimens, however, are compact and granular.

These ores assay as follows:

Ores.	To 100 kilogrammes of ore.
a—Ores of Gennamari—	
Lead	76 to 81 kilogrammes.
Silver	50 to 66 grammes.
b—Ores of Ingurtosu—	
Lead	76 to 81 kilogrammes.
Silver	24 to 34 grammes.

The Talisker Silver Lead Company of South Australia made an interesting exhibit of the ores and of the bars of lead produced from them.

Some very rich specimens of argentiferous lead ores were shown in the collection from Colorado. The veins are said to be large and numerous, and it is reported that other discoveries of rich silver ores have been made during the past Summer.

PLATINUM AND MANUFACTURES FROM IT.

Numerous masses of native platinum were shown in the Russian section from the washings on the estate of Prince Demidoff, in Siberia. One of these masses weighed thirteen pounds. The smaller nuggets were quite magnetic, and attracted iron filings like loadstone.

The most attractive display of this metal, and probably the finest ever made, was by the firm of Johnson, Matthey & Co of London, who are the most extensive and expert manufacturers of articles in platinum for the use of chemists and others. The actual value of the metals and articles manufactured by them, in two cases, was nearly $100,000. The attention was first attracted by the enormous size of the platinum boilers used for the concentration of sulphuric acid. These are in the form of stills, nearly four feet in diameter and are sufficiently capacious to concentrate eight tons of acid a day. They show many improvements over old patterns; but what is most remarkable is, that they are made without joints, soldered with gold as usual. They may be considered as formed of one piece of metal, and as specimens of autogenous soldering they are remarkably fine and interesting. The price of a still of the capacity of five tons a day is four thousand francs, and of one that can concentrate eight tons, sixty-two thousand five hundred francs.

There was a great variety of smaller platinum vessels, such as evaporating dishes, crucibles, small stills for fluoric acid, siphons, tubes and alembics, all of them showing great skill in forging and working the metal.

Alongside of these vessels there were several large ingots of the metal chemically pure, and intended for the fabrication of sulphuric acid stills.

These ingots are about as large as two bricks placed side by side, and they were melted under the oxy-hydrogen blow-pipe, according to the method of St. Claire Deville and Debray. A few irregular projections on these masses show how perfectly fluid the metal was—so much so as to penetrate into every small cavity of the mould. There were but few of the many persons that looked upon those triumphs of science that knew that even a small wire of the same metal cannot be melted in the hottest forge fire. Each of these ingots is valued at thirteen hundred francs. In addition to these ingots there was a model of the great ingot melted for the Exhibition of eighteen hundred and sixty-two. This ingot was the largest ever made and weighed one hundred kilogrammes, and was valued at eighty-five thousand francs. It is not probable that another ingot of equal size will be produced. The model was therefore of peculiar interest and value.

APPARATUS FOR ASSAYERS.

Among the great variety of objects, there was an apparatus in platina for facilitating gold assays. This, if not already in use by our assayers, should interest some of our establishments in San Francisco, for it is

claimed to be a great improvement upon old methods and to give more exact results.

It consists of two shallow kettles of platinum about a foot across the top, set in holes like those of the top of a stove, so that heat from a gas lamp or stove can be applied below. The nitric acid for dissolving the silver out of the assays is placed in the kettles. A frame of platina, made to fit the kettles, is divided into two hundred or more little partitions, into each of which a small platinum cup is placed. These cups are not larger than a child's thimble, and are movable. The bottom of each is pierced with fine slits at right angles, so that the acid can enter when they are lowered with the frame into the kettle, and so that it may drain out when the frame is raised. It will be seen that the number of assays is limited only by the number of the cups. No glass is used. By means of this apparatus the pouring off of acid and the separate washing of each assay is avoided. It has been in use for five years in the laboratory of the firm with complete success. The whole apparatus with two kettles is about two feet long and thirteen inches wide. A porcelain hood covers the kettles and discharges the distilled acid into a vessel at one side.

MAGNESIUM.

The same firm exhibited an obelisk of pure magnesium, weighing five kilogrammes, or eleven pounds. The metal was shown, also, in large quantities in the shape of foil for batteries, in ribbons and wires of various sizes. In another part of the Exposition a little apparatus was shown containing a coil of magnesium wire which may be fed out regularly as fast as it burns. The whole is not larger than a watch, and may be carried in the pocket in readiness for the production of a light almost equal to that of the sun. This would be very useful in caves and in the examination of the dark galleries and chambers of mines, but the direct light should of course be carefully kept from the eye.

IRIDIUM, OSMIUM AND OTHER RARE METALS.

The exhibition of the rare metals was the most complete ever witnessed, and rejoiced the heart of a chemist, who perhaps had never before seen more than a grain or two of some which were there shown in massive ingots. A bar of iridium, for example, two or three inches long! This was the second which had ever been melted and cast, and was made up of small grains not much larger than the tips of a gold pen. This metal is so hard that diamond dust must be used to cut it; and the question here arises whether in this solid form we may not use it for tools by which to cut hardened steel, and turn and fashion the hardest rocks.

The bar of osmium which was near by—a metal generally found in nature in close association with iridium—presented a totally different appearance, for it looked like a mass of coke.

Ruthenium is the only one of these rare elements which was not shown in great quantity. There were a few grains as large as peas. But any disappointment in this case was more than compensated by the sight of a goodly quantity of boron and silicon, and of a remarkable series of the various metals cast in cylinders of equal diameter, but each specimen having the same weight (one kilogramme, or about two pounds each). The result was that the cylinders had very unequal lengths, and thus exhibited in a very striking manner the difference in the specific weights of the metals. The series contained gold, silver, platinum, iridium, rhodium,

palladium, lead, bismuth, copper, cadmium, cobalt, nickel, iron, antimony, zinc, magnesium, aluminum, thallium, sodium, potassium, osmium (not melted) and mercury.

Each cylinder was about one inch in diameter. Quicksilver, which was in a melted state at our ordinary temperatures, and the metals which oxidize rapidly in the air, were confined in glass. The other specimens were just as they came from the mould.

The platinum cylinder was about four inches long; the quicksilver about seven inches, and the others elongated by a very regular gradation up to aluminum, which towered two feet above the preceding, and was in its turn overtopped by the magnesium cylinder nearly four feet long. Thus, at one end of the series, a bar of metal four feet long would just counterpoise the bar of platinum, only seven inches long, at the other end.

In the collection sent from the metallurgical works of Freiberg, Saxony, there was an ingot of the new metal, indium—a great novelty—which was prepared by Professor Richter at great cost.

CHAPTER V.

USEFUL MINERALS, MATERIALS FOR PORCELAIN, ORNAMENTAL STONES AND GEMS.

EMERY.

The Chester Iron Company of Massachusetts sent a splendid illustrative series of the emery and the accompanying minerals from the recently-discovered bed in Chester, Massachusetts. This, it will be remembered, was discovered by Dr. Jackson, of Boston, in some samples of magnetic iron ores sent to him for assay. This was one of the most striking examples of the direct practical value of mineralogy as a science. The mineralogical association of emery had been previously studied with much care by Dr. J. Lawrence Smith, and he had observed that the foliated white mineral which he called *emerylite* was an almost constant companion of emery or corundum. The recognition of this mineral in the Chester specimens caused Dr. Jackson to indicate the existence of emery at that locality to the company, and the result was the opening of a deposit of great size and of superior quality. The Jury recognized this discovery by awarding a medal to Dr. Jackson, although he was not a participator in the display.

GRAPHITE.

The number of specimens of graphite from various parts of the world was very great, and was exceeded only by the display of the various articles into which this mineral enters as the chief constituent—such as crucibles, melting pots, pans, furnace linings, etc.

The great attractive and brilliant display of the raw material was made by M. Alibert, who sent a large quantity of the mineral in its raw state from Mount Batougal, near Irkoutsk, in Siberia. This graphite is remarkable for its density, freedom from grit, for its blackness and for a peculiar fibrous structure which shows upon the surface of the block like the grain of split wood. This structure has already been noted by the celebrated Russian mineralogist, General Kokscharof, in his Mineralogy of Russia. Most of the masses have a prismatic form,

and are from one to three feet long and are only a few inches in diameter, looking as if they had been split out like wood. It is very dense and homogeneous, and can be sawed and cut into any desired shape, and will bear cutting into long pencil-like masses with very sharp and firm points, and it is therefore well adapted for pencils, for which it is beginning to be largely used. There were some specimens which exhibit a peculiar pisolitic or nodular structure, and others which resemble the fibrous form of amianthus or satin-spar. It appears to be found in highly metamorphosed hornblendic rocks.

GRAPHITE IN BOHEMIA.

A very important exhibit of graphite in its raw and prepared state was made by the proprietors of deposits in Bohemia, which annually furnish large quantities of a very superior article for pencils, steel manufacture, the galvanoplastic art, and for various other purposes.

Mr. Victor Norback, who has made a special study of the industry of graphite, and has long been engaged in it, has kindly given me much information, which is presented in the following summary:

The principal localities are in Southern Bohemia, near Budweis. The graphite occurs there in great quantities, inclosed in gneiss and granite, together with limestone, which last is a constant associate. The graphite is in shistose layers, which vary from one inch to ten or twenty feet in width. The finest qualities are found in the middle, and are not over six inches thick. The different layers of graphite are quite distinct and parallel, and five or more are recognized.

These deposits have been worked for sixty years, and it is said that the manufacture of lead pencils would not have reached the present degree of perfection without the graphite of these mines. The pencil-makers of Bavaria, and the celebrated establishments of Faber and of Rehback use this graphite exclusively.

The clean masses of this Bohemian graphite have the following composition:

Ingredients.	Per cent.
Carbon	72.40
Oxide of iron, limestone, magnesia, alkalies, sulphur and water	17.60

The finest portions give over eighty per cent. carbon. At the beginning of this century the production was not important, but it has been steadily and rapidly increasing, as the following figures show. The production was, at different periods, as follows:

Years.	Cwts.
1823	103
1833	14,594
1843	16,000
1853	24,970
1863	83,778

The following table shows the amount produced (in hundred weights), of different qualities, for four years, from eighteen hundred and fifty-seven to eighteen hundred and sixty, inclusive:

Location and Company.	1857.	1858.	1859.	1860.	Quality.
Mine of the Duke of Schwartzenberg, in Schwartzenbach	10,920	9,681	7,758	10,374	I
	3,610	1,311	7,051	4,484	II
	17,843	23,825	31,147	21,683	III
Mines of Eggert & Company, in Mugrau	376	620	292	18	I
	1,220	951	633	708	II
	1,994	2,164	717	2,381	III
Mines of the peasants, Mugrau	931	792	814	708	I
	880	728	1,253	1,292	II
	955	844	1,631	1,809	III
Stuben mine	35	.....	.....	.....	III
Menzel and Barthol, Stuben	.....	160	200	950	III
Krauman	20	80	.....	.....	III
Anton Hofbauer, in Wettern	.....	.....	.....	25	III
Bistel & Company, in Krauman	.....	.....	.....	2,400	III
Totals	38,784	41,156	51,496	46,832	

The value of the total production at the present time is estimated at two hundred and fifty thousand dollars annually. The establishment of Krupp, at Essen, consumes twenty thousand hundred-weight annually. The mines of the Duke of Schwartzenberg are now of great extent. They produced in eighteen hundred and sixty-six:

Quality.	Austrian cwts.
First	10,000
Second	4,000
Third	60,000
Refined (washed)	36,000
Total	110,000

There are four steam engines, with an aggregate of one hundred and twenty-two-horse power, and two hundred and fifty men are employed.

GRAPHITE OF TUOLUMNE, CALIFORNIA.

The samples of California graphite compare favorably with those of the celebrated Bohemian deposits, and will no doubt be found equally valuable for similar purposes. I was able to make a direct comparison of the two, with the assistance of Mr. Norback. This is one example of the advantages derived from sending a collection of California minerals to the Exposition.

GRAPHITE OF CANADA AND OTHER LOCALITIES.

Large masses of graphite were sent from Canada, together with the washed powder, and some solid masses cut into cubes and other forms. These were homogeneous, but the graphite appears to be much more crystalline and foliated than the graphite from the localities previously noticed. It occurs in Buckingham, in Lawrentian rocks. The graphite from Ceylon also shows a decidedly foliated crystalline structure. It is largely used in England and in the United States in the manufacture of crucibles. The principal exhibitors of plumbago crucibles and similar objects, were: The Patent Plumbago Crucible Company, under Morgan's patent, Battersea Works, London, which received a silver medal. Some of their pots were three feet high. Boulton & Company of London exhibited a black lead pot five feet high. Becket & Sons, of London and Hull, showed a quantity of plumbago in large cakes formed of the purified and compressed mineral.

The celebrated Cumberland plumbago was exhibited in the form of pencils made in the building by some of Mr. B. S. Cohen's experienced English workmen. Mr. Cohen claims "to have perfected a process by which the powder and fragments of the Borrowdale lead (hitherto laid aside as almost useless), after being pulverized, are consolidated and brought to a uniform consistency and so formed into slips of the exact size and degree required for each pencil, the lead retaining in its improved form all the valuable qualities which characterize fine Cumberland plumbago." The Six H, engineers' pencils, are excellent.

CRYOLITE.

A mass of this mineral three feet long and two feet thick, from Ivigtout, Greenland, was exhibited by the Greenland Cryolite Mining Company. This mineral is now largely used as a source of sodium and its compounds, and nearly twenty thousand tons were shipped in eighteen hundred and sixty-six. It was discovered in Greenland by Giesecke toward the end of the last century. In eighteen hundred and fifty Professor Thomson, of Copenhagen, discovered the decomposability of cryolite by lime, upon which all the manufacture of cryolite soda depends. This was patented in eighteen hundred and fifty-three. The first vessel was sent to Greenland for cryolite in eighteen hundred and fifty-six, and the first manufactory of cryolite soda was established in Denmark in eighteen hundred and fifty-eight. One was established in Germany in eighteen hundred and sixty, and was followed by the erection of works in the United States in eighteen hundred and sixty-five. A company to work the mines was formed in eighteen hundred and sixty-five, with a capital of five hundred thousand rix dollars, under the direction of Professor Julius Thomson and S. W. Isberg.

This history, in brief, affords another example of the direct practical

value of mineralogical science. It shows what extended industrial results may follow from the discovery of an apparently unimportant mineral. The following shows the extent of the exportation of cryolite up to the year eighteen hundred and sixty-seven:

Year.	Number of vessels.	Annual exports. Tons.
1856	1	.343
1857	1	800
1858	4	2,359
1859	5	2,788
1860	7	4,821
1861	18	7,639
1862	24	11,046
1863	10	5,498
1864	9	4,261
1865	25	19,892
1866	23	19,853
Totals	127	79,300

The duties paid to the Government amounted to four hundred and seventy-five thousand five hundred and fifty-nine francs. Five and a half cubic feet are reckoned to each ton.

ORES OF POTASH—STASSFURT PRODUCTS.

The discovery of extensive mineral deposits of soluble salts of potash has led to a complete revolution in their production and value. It has been found that the salt beds at Stassfurt, on the line between Prussia and Anhalt, are accompanied by extensive deposits of chlorides of potassium, sulphate of potash and magnesia, boracic acid and other compounds —all of considerable commercial value. Borings have been carried to a depth of twelve hundred feet without passing through these deposits, and their extent is yet unknown, but they are regarded as practically inexhaustible. The salt is mined in large quantities, and large pillars are left to support the roof; only about three quarters of the mass is removed. This salt is filled with thin sheets of anhydrite in wave-like layers. The potash salts are found above the salt with a layer of boracite (a borate of magnesia) between them. The mineral carnallite, a double chloride of potassium and magnesium, has a red color and is used chiefly for the preparation of potash. It is now exported in large quanties to the United States for the manufacture of saltpetre by the decomposition of nitrate of soda. As in California we readily obtain nitrate of soda from South America, this manufacture may perhaps be carried on to advantage in San Francisco, and our chemical and powder manufactories may profit by this suggestion. In view of the great importance of this potash mineral, an attempt has been made to have it placed upon the list of articles to be admitted to the United States free of duty. Its use in Europe has already checked the exportation of potash from the United States.

One of the most important results is the employment of potash compounds, especially the sulphate, as fertilizers, and there are already extensive establishments for their manufacture. The discovery is especially valuable to the beet growers, and it is said to have revived this languishing industry. Ziervogel & Company, at Stassfurt, advertise fertilizing salts at the following prices per one hundred kilogrammes (two hundred and twenty pounds), delivered at the railway, exclusive of cost of packing:

Article.	Per cent.	Price, francs.
Sulphate of potash, crude	18—20	3.75
Double sulphate of potash and magnesia	30—33	6.25
Sulphate of potash	55—60	18.75
Sulphate of potash, refined	80—85	30.00
Carbonate of magnesia, for legumes		5.00
Sulphate of magnesia, crude		3.75

All these manure salts are well dried and ground and can be transported in sacks.

Another large establishment at Cologne, Vorster & Grüneberg, advertise similar compounds at the same prices.

The cost of transportation from Stassfurt to Havre for five thousand kilogrammes is about four francs for each one hundred kilogrammes. Cost of sacking, one franc twenty-five centimes per one hundred kilogrammes.

BORAX.

There was no display of borax at all comparable in interest with that made by the California Borax Company, in the two collections sent on. (Vide Catalogue.) The crude native crystals, as extracted from the mud of the lake, are remarkable for their great size. Several of those shown were from three to five inches long and from one to three inches thick, and they were regarded with much interest by mineralogists.

PORCELAIN AND THE MATERIALS FOR ITS MANUFACTURE.

It is impossible to describe the variety and beauty of the porcelains of Sevres and Limoges, of England and of Prussia. Those of Sevres occupied a large space in a kind of hall or saloon, the walls of which were decorated by the inimitable Gobelin tapestries. Minton & Co., of Stoke-upon-Trent, made a great display of their superior manufactures, among which may be noted particularly their *faiences* of original and artistic patterns; their large vases for plants; ornamented dishes for the table, and their tiles in great variety. The beautiful productions of the Wedgwoods were also shown, in the form of vases and tablets, with their exquisite bas reliefs, which last are now much used for the decoration of furniture. The collection of Dresden China was particularly fine. One vase measured over six feet in height and was accompanied by candelabra also six feet high.

The displays of French *faience* were extremely interesting. The prevailing infatuation for specimens of the old enamelled wares of the

sixteenth century has excited manufacturers to produce imitations of the curious productions of Bernard Palissy, of Lisieux, and of Rouen and Nevers. These manufacturers, most of them from Haute-Vienne, made a collective display. The display from Creil and Montereau may also be cited. Artistic *faience*, however, has its centre in Paris and its environs. The great centres of the manufacture of porcelain in France are Limoges, where there are more than thirty white China works, Berry and Paris and its environs, including Sevres and Champagne. A large business is carried on in Paris in the decoration of porcelain, and one thousand three hundred and sixty-two men and four hundred and fifty-eight women are occupied in this way alone. Paris is regarded as the great centre of the porcelain and *faience* trade, and Limoges is next in importance. The value of the annual production of fine *faience* in France is estimated at ten million francs, and that of porcelain at twenty million francs.

Clay for making pottery is found in almost every part of France. The kaolins of St. Grieix, near Limoges, are the types of the best clays for the manufacture of China, but the kaolins of the Pyrenees, the Cher and the Allier are competing with them, and are largely used at Berry.

It is observed by the Committee of Admission of Class XVII that steam power has been successfully substituted to a great extent for hand labor in the making of *faience*, but not in the manufacture of porcelain, for the softening caused by the high temperature required for the baking deforms pieces made in any other way than by hand. The hope is expressed, however, that machinery may yet be employed with success in preparing and shaping the material. Workmen are almost always paid by the piece, and owing to the tenderness of the material, which prevents its being moved about, it is necessary for them to work in the factories.

The improvements in the ceramic art in France during the past twelve years are enumerated by Salretat and Dommartin as follows:

"*First*—The increasing use of terra cotta in the decoration of public and private edifices.

"*Second*—The almost complete renewing of the plant of the *faience* potteries, so that good organization, from being an exception, has become the rule.

"*Third*—The substitution of coal for wood in the baking of porcelain, and the consequent reduction in the cost of the process.

"*Fourth*—The improvement introduced into the art of decoration through the chromolithographic process."

Among the many exhibitions of materials for the manufacture of porcelain, the following may be cited. An excellent kaolin is found in Brittany, and contains fifty-three per cent. of useful earth, of which the following is an analysis:

Component parts.	Analysis.	A
Water, by ignition	12.50	13.10
Silica	48.00	48.00
Alumina	37.36	37.00
Oxide of iron	00.75	2.50
Lime	00.15	
Magnesia	00.48	
Alkalies	00.76	
Totals	100.00	100.60

The second column of figures (A) represents the normal composition of the kaolin of St. Grieix, which is reputed to be the best kaolin known. A mixture of this kaolin of Brittany as follows:

Brittany kaolin clay	76
Residue of the same, crushed	20
Chalk of Bongival	6

gave a paste which, in baking, gave a good white and translucent body.

A sample of feldspar in the Swedish section was shown by B. R. Geyers, of Stockholm, together with a display of the porcelain ware made out of it. It is an orthoclase, and is sold at the rate of thirty-five francs per one thousand kilogrammes—about seven dollars per ton, crude. It contains twelve per cent. of potash and three per cent. of soda.

Another exhibit from Sweden, from the quarries of De Heidenstam, near Stockholm, consisted of both potash and soda feldspars. It is delivered in quantity at Havre for sixty-five francs; at Rouen for seventy francs, and at Limoges for one hundred francs per one thousand kilogrammes.

TERRA COTTA.

Terra cotta is coming into extensive use for architectural decoration. A great display of this material was made at the Exposition, not only in the form of ornaments for buildings, but in vases, columns and monumental figures. The beautiful twisted columns of the boiler-house in the Park were made of terra cotta, and were justly much admired. In London, the South Kensington Museum, and other public buildings, are decorated with terra cotta ornaments. It is used also at Berlin for the new Chemical College, and for the Cathedral.

As the materials for this manufacture are abundant and cheap in California, and as the climate is especially favorable, terra cotta should be extensively used. Some very fine specimens of this manufacture were shown at one of the Fairs of the Mechanics' Institute a few years ago.

MICA.

S. H. Randall, of New York, exhibited specimens of mica (isinglass), feldspar for porcelain manufacture, beryls and quartz. The sheets of

mica were very broad and colorless, and far superior to any other shown. The mineral is used largely for transparent doors for stoves and furnaces.

ORNAMENTAL AND PRECIOUS STONES.

There was a very large display of ornamental and of precious stones, either in the rough or cut and polished. Among the ornamental stones we include marbles, serpentine, granite and porphyry, which were shown in columns, vases or tablets beautifully polished; and jasper, onyx, malachite and lapis lazuli, which are worked into smaller objects. In these last named stones the collection from Russia was particularly rich. One of the most conspicuous objects was an elliptical vase, about six feet high, sculptured at the Imperial establishment of Ekaterinberg, out of a compact gray jasper from Kalkhansk. The shaft supporting the basin was ornamented by an entwined vine branch, with leaves and fruit exquisitely chiselled in high relief and polished.

Two magnificent candelabra, with pedestals of rhodonite, were shown, from the same establishment. These pedestals were over eight feet high and were nearly two feet broad at the base, but are probably formed of several pieces united. The rhodonite appears to occur in large homogeneous masses, and to be extensively employed for ornamental purposes. It takes a high polish and has a pleasing rose-red color, slightly mottled with black. The pedestals are beautifully formed, and the numerous arms for sustaining its candles are of metal elaborately chased and gilt.

Jean Stebakoff, of Ekaterinberg, exhibited a great variety of beautiful paper weights, made of polished slabs of jasper, malachite or lapis lazuli, surmounted by groups of flowers or bunches of fruits in their natural colors, all cut out of various high-colored ornamental and precious stones. Similar ornaments adorned the lapis lazuli panels of the magnificent cabinets presented by the Emperor of Russia to the Empress Eugenie.

The Government establishment at Tiflis, Caucasus, sent numerous ornamental objects fashioned from a kind of onyx—marble similar to the beautiful stalagmite marbles of Mexico and of Algeria; also a variety of smaller objects, in a peculiar chatoyant obsidian. The marble onyx of Algeria was largely shown in the collection sent from that country, and it is now extensively used in Europe for ornamentation either in a variety of small objects of art, such as pedestals, inkstands, paper weights, or inlaid as borders in marble slabs for tables.

The Aberdeen granite, which has a pleasing red color, was shown in large columns beautifully polished. It is coming into extensive use in England for ornamenting public and private buildings, and is deservedly much admired. The two polished columns at the entrance of the Pacific Mail Steamship Company's office in New York are formed of this stone.

Among the marbles, the mantel made of the Suisun marble of California deserves particular mention for the unique beauty of the material. It was shown from the establishment of J. Shuster, Brooklyn, New York, together with mantels of the same pattern made out of Tennessee marble and the white statuary marble of Vermont. The California marble was much admired by connoisseurs. Specimens of other marbles from California were shown in the collection made by Dr. Pigné.

There were some beautiful vases and slabs of polished porphyry from Norway, and a very interesting suite of the marbles of Italy, in blocks

about one foot square. The verd antique marbles (or serpentines) of that country were shown by a series of sixty specimens, each one highly finished, and differing, in either texture or color, from the others.

The wealth of the Russian Empire in precious stones was illustrated by a series of magnificent cut gems of the country, sent from the Imperial cabinet. This series contained amethysts, sapphires, emeralds, aqua marines, beryls, phenacites, white topaz, rubellites, tourmalines, sphene and chrysoberyl, all of them of unusual size and brilliancy. Some of the phenacites, which had a brown color when first shown, became bleached and colorless after exposure to the light.

The costly displays of jewellery by the leading British and Continental jewellers contained a great variety of precious stones, remarkable for their size and beauty. Hancock & Co. of London exhibited a sapphire of fine color, one and a half inches long and three quarters of an inch wide. M. Melléno exhibited a number of very large sapphires, and one of them weighed four hundred carats.

DIAMONDS.

In addition to the great number of large and well selected and matched diamonds mounted in various ways for personal adornment, some of the exhibitors added greatly to the interest of their displays, and gave them an additional scientific value, by showing the gem in its various colors; thus, for example, the following different colors were shown by a suite of nine large stones in the case of Hancock & Co.: Dark green; light green, like chrysolite; topaz yellow; hyacinth red; pink, like pink topaz; cinnamon-brown; bluish black, and black with a lavender shade. A peculiar steel-like and graphitic lustre of the gem was well shown in a tiara and necklace, formed of about forty stones, varying from one fourth of an inch to five eighths of an inch in diameter, but not, however, wholly free from flaws.

The interesting art of cutting and polishing diamonds was exhibited by M. Coster of Amsterdam, in a building erected for the purpose in the Park. A separate steam engine was erected in this building, and several of M. Coster's workmen were constantly engaged there in all the operations required to prepare the rough jems for jewellers. All the processes of scraping, cleaning, facetting and polishing were witnessed daily by hundreds or thousands of persons. The exhibit had also a very great scientific interest, inasmuch as the rough stones from the principal diamond-producing localities were shown in all their varieties of crystalline form and color, together with the minerals and washed pebbles usually found with them in the deposits. In the suite of diamonds of different colors there were several remarkable stones. One of them weighing twenty-nine carats (about ninety-two grains), a pear-shaped brilliant, about three quarters of an inch long, has the property of acquiring a rose-pink color, like that of a rose spinel on being strongly heated. This color is retained in the dark after cooling, but if the diamond is exposed to the light the color soon vanishes. This experiment has been repeatedly performed with like results. Another stone, half an inch or more in diameter, having a beautiful bluish black color by reflected light, appeared perfectly opaque when held between the eye and the light, owing, probably, to the total reflection of the light from the facets of the stone.

The collection contained masses of the crude black variety of diamond known as "carbon" (valuable for its powder), which are sometimes two

inches in diameter. Another variety, translucent, and apparently a compound crystallization, and of no value as a gem except for its powder, is found with the diamonds of Rio and is known as the "boast."

The rolled and water-worn pebbles found with the diamond consist chiefly of the heavy minerals, such as magnetite, chromite, ilmenite, sutile, tin-stone and other mineral species very similar to the coarse, heavy, black sand obtained in sluices by gold washers when they "clean up." All these minerals are evidently derived from the rocks eroded by the streams and concentrated in their beds, without having any special connection with the diamond or its matrix.

The conglomerate called *cascalho*, which was shown in all its varieties, evidently corresponds in its origin to the "cement" of gold miners. It consists merely of the water-worn pebbles and heavy minerals which accompany the diamonds in the streams, cemented together at and near the bed-rock by the infiltration of silicious, calcareous or ferruginous waters. These masses of *cascalho*, or diamond cement, contained diamonds cemented in the midst of the pebbles.

This cement is found in large quantities and only a portion of it is broken up by hand. There is little doubt that with machinery it could be so broken that many of the diamonds could be liberated without injury. In gold districts more or less gold is found in the deposits and in the cement with the diamonds.

The yearly importation of rough diamonds from eighteen hundred and sixty-two to eighteen hundred and sixty-six has averaged one hundred and seventy-six thousand carats, or nearly one thousand pounds troy.

OPALS, TURQUOISE, BERYL.

Some remarkably large opals were shown by Emil Goldschmidt, of Lower Austria. The largest one, oval in form and about two and a half inches long and an inch wide, was valued at seventy-five thousand francs. A second, of triangular shape and about one and one half inches across the face, was valued at fifty thousand francs, and the third, an ellipsoidal specimen, one and one half inches long and three-quarters of an inch in diameter, at thirty thousand francs. The amygdaloidal rock in which the gem is found was also shown.

A fine series of turquoise specimens, in the rough and cut, was shown by Petiteau, of Paris. Amongst the cut stones there were several of good color as large as pigeons' eggs.

One of the ornaments of a massive piece of ornamental work for the Emperor's saloon at the Hotel de Ville consisted of a bust of his Majesty, about one third life size, cut out of a single aquamarine of good color and free of flaws. It is supported upon a pedestal of bloodstone, and figures upon each side, representing peace and war, are cut out of smoky crystal, and are draped with silver.

Many very large and transparent crystals of quartz were sent from Japan, Province of Kei, where it occurs in abundance and is wrought into many ornamental objects besides the large crystal balls. An optical examination of some of these crystals by M. Des Cloizeaux showed that, in common with quartz from most other localities, the internal arrangement of the particles is so complex that plates giving a uniform tint in polarized light cannot be obtained.

A large mass of nephrite (jade), and highly polished, was sent from Siberia by M. Alibert. It was about two feet long, and weighed one

thousand pounds. This stone, which is so much prized for ornaments in China, is beginning to be used in Paris for the same purposes. Lapis lazuli, polished jaspers, porphyries, malachite, and other highly colored stones, are now used to a considerable extent for panels and ornaments upon choice pieces of furniture.

CHAPTER VI.

CIVIL ENGINEERING—SUEZ CANAL—BÉTON—ASPHALT AND BITUMEN—ASPHALT PAVEMENTS.

MODELS OF PUBLIC WORKS.

To civil engineers the exhibition of models of the most important public works of France and other countries was exceedingly interesting. The models in the French section were singularly complete, and on such a large scale that the minute details of construction could be clearly seen. In fact, it is better to study the construction of the works by the models than to examine the works themselves, for in general the models are so made that they show the interior as well as exterior details, from the foundation stones up. For all sub-aqueous structures the models are of course preferable. The scale is generally one twenty-fifth of full size, but varies from one tenth to one fiftieth.

In the Spanish section there was a sectional model of the great breakwater of Tarragona. This work, when finished, will be about fifteen hundred yards long, and one hundred yards wide at the top and three hundred yards at the base. Enormous blocks of rock are first thrown down, and interspaces are filled with smaller fragments. A layer of concrete is then laid, and thus forms the foundation for the pier. It will be seen that this construction is similar to that adopted by the Harbor Commissioners of San Francisco for the harbor wall.

SUEZ CANAL.

The progress of the great Suez Canal was fully illustrated in a separate building in the Park by a large model, a panorama, photographs and miscellaneous collections. The model of the Isthmus was a complete miniature representation of the country, with all its elevations and depressions, on a scale of one to five hundred thousand. But the canal and the elevations were somewhat exaggerated, the canal being as six to

one, and the heights as sixty to one. The distance between the Mediterranean and the Red Sea is about seventy-five miles, but the length of the canal will be about one hundred miles. Sixty-three miles of the distance is either at or below the sea level, and the remainder of the route requires cuttings of no very great depth, and in sand or earth. Those portions of the route below the sea level are where the canal enters a great interior basin, which it is believed was at no very distant period occupied by the water of the Red Sea. The completion of the canal from the Red Sea to this basin will allow the waters to enter and fill the basin. It is computed that it will hold nine hundred millions of cubic metres of water. At present it is occupied by shallow lakes of bitter water, and by extensive beds of salt, covered in places by a soft, marshy deposit, upon which it is very dangerous to venture. The region, in fact, is very similar to some of the old lake basins in Nevada during the rainy season.

The canal is to have a breadth of one hundred metres at the water line, and a depth of eight metres. The slope, or batter, of the sides varies somewhat in different portions of the route, according to the nature of the ground. It is nowhere less than two horizontal to one vertical.

The beach of the Mediterranean, for a long distance from the mouth of the canal, has a very gentle slope, and it was necessary to construct an artificial harbor or port, by the aid of long jetties or breakwaters. The place selected is known as Port Said. Two breakwater piers have been built out into the sea; that on the west side is about three thousand one hundred metres long, and that on the other side about one thousand six hundred metres. Their shore ends are one thousand four hundred metres apart, and as they extend seaward they converge to within seven hundred metres, and one projects somewhat beyond the end of the other. The space included between these two great arms is sufficient to accommodate fleets of hundreds of vessels, and they can lie there in safety while waiting their turns for the passage of the Isthmus. This artificial harbor will be dredged out to a depth of thirty feet. The jetties are about seventeen feet wide on the top, and they rise about seven feet above the average level of the Mediterranean. The talus slopes at an angle of forty-five degrees.

For the construction of these enormous piers it was at first proposed to use stones obtained from a quarry beyond Alexandria, but it was found that it took a long time to obtain them, and the expenses of transportation were great. This induced the company to enter into a contract with Messrs. Dussaud Brothers, to make artificial blocks of stone out of lime and the beach sand—a method which this firm had successfully employed at Marseilles, Cherbourg and d'Alger.

These artificial blocks are made by mixing the beach sand with Theil hydraulic lime in the proportion of three hundred and twenty-five kilogrammes of lime in dry powder, with one cubic metre of sand. The mixture is allowed to set and dry in the moulds, and is then exposed for two months to the sun and air, which hardens it into solid stones sufficiently firm to permit them to be placed, and the hardening continues below the water. Each of these blocks weighs twenty-five thousand kilogrammes. They are moved and placed, by the aid of steam cranes, with as much care and precision as a mason places a brick in a wall. The interspaces are filled with small stones, and under the action of the sea the whole soon becomes a compact and solid mass. The total cubical

contents of these piers will be nearly two hundred and fifty thousand metres.*

PROGRESS OF PUBLIC WORKS IN FRANCE.

It appears by the report of the Baron Baude, member of the Committee of Admission of Class Sixty-five, that nine thousand kilometres of railway were built in France in eighteen hundred and sixty-six, and that "the works in ports, for the lighting and erection of beacons on the coasts, for the salubrity of towns, the sewers, and the distribution of water, have received a proportionate impulse, and that the greater part of the large towns of France have been completely transformed by their application. The Committee also points out, among the principal technical improvements realized since eighteen hundred and fifty-five:

"*First*—The progress made in the trades of hydraulic lime, cements, artificial stones, potteries, slate and asphalts, and in that of hammered metal applied to the preservation and decoration of roofs.

"*Second*—The increase of the use of metal structures, which are more and more appreciated every day.

"*Third*—The increase in the number of machines employed in working wood for joiners and other work.

"*Fourth*—The constantly increasing application of compressed air in places deep and difficult of access.

"*Fifth*—The ingenious methods of lifting heavy bridges, viaducts and other metallic works.

"*Sixth*—The new system of movable dams.

"*Seventh*—The recently invented and powerful dredging apparatus.

"*Eighth*—The application of electricity to light-houses, and the new combinations made with a view to assist navigation—amongst which may be reckoned the creation of a system of coast semaphores."

We may here mention, in addition, the very great changes that are making in the City of Paris by opening new and broad avenues through the most crowded portions, the erection of new and superior buildings, and the construction of a new trunk sewer at a considerable depth below the surface to convey the sewerage of the city to a point upon the Seine several miles below. This work is prosecuted by means of shafts sunk at intervals, in the same way that drain tunnels are made for mines.

CEMENTS, BÉTON.

A French cement company of Boulogne-sur-Mer made a very interesting exhibition of French "Portland cement," for which they received a gold medal. The extraordinary strength of this cement was shown by means of blocks cut into the form of the letter I, the projections at the top and bottom serving to hold iron clamps by which weighted platforms are attached to show the strain which the various mixtures of cement and sand or pebbles will bear. A block of this shape, one and a half inches square in the centre and made of a mixture of four volumes of sand and one of cement, sustained a weight of nine hundred kilogrammes (about two thousand pounds). Another block four inches square, composed of two volumes of sand and one volume of cement, sustained a

* For further details reference may be made to "Exposition de la Compagnie Universelle du Canal Maritime de Suez." 8vo. Paris, 1867. Exposition Universelle.

weight of one thousand two hundred kilogrammes. The "sand" mixed with this is as coarse as beans and peas.

Another and very striking mode of testing is to make a column of bricks, united by cement, and after they have dried, to extend the column horizontally like an arm, supported at one end only, thus bringing the strain of the weight of the whole mass upon the last joint of cement. Some columns six feet long were shown extended in this way.

Important results are obtained by the employment of "*bétons agglomérés*," which consist of intimate mixtures of sand and lime, with a very small amount of water. The novelty does not consist in the use of new materials, but only in the manner of preparing and using them. It is claimed that by securing the intimate admixture of the materials, and the use of only just sufficient water to moisten the surfaces of the grains of sand, the mixture rapidly hardens into stone, and that the particles are held together with extraordinary force. The use of water in excess, as in ordinary mortar, it is said, leaves innumerable cavities, which render ordinary mortars porous, friable and crumbling. This mixture, when properly prepared, may be moulded into any form, and will, in a few days at farthest, become as hard and firm as natural stone, and quite as capable of resisting the action of the weather. With these properties it is easy to see that monoliths of almost any dimensions may be made, and that the mixture must be of immense value in building.

ASPHALT AND BITUMEN.

But the results with Béton are not so extraordinary as those obtained with a calcareous rock impregnated with bitumen, which is now successfully employed for paving the roadways of the finest streets of Paris. This rock is comparatively rare, being found at only a few localities in the Jura Mountains, where it can be extracted with advantage. It is called *asphalte* by the French, but consists of ninety to ninety-four per cent. of carbonate of lime and ten to six of bitumen, and is a bituminous or asphaltic limestone. It has the appearance of crude gypsum, and has a chocolate color, but becomes white or bleached on exposure to the weather. On close examination it is found that each small grain or particle of the rock is enfilmed with bitumen, coating it like a varnish and causing all the particles to closely adhere. When the rock is heated this bitumen softens, and the mass crumbles to powder, but speedily hardens upon cooling. Upon this property is founded its use for paving and other purposes.

The roadway is first graded and covered with a layer of concrete from four to six inches thick, according to the nature of the ground, the object being to furnish a firm, solid foundation upon which to spread the hot powdered asphalt in a thin, even layer. The asphalt rock is first broken into fragments about as large as those ordinarily used in macadamizing. It is then "decrepitated" by heating it in sheet iron vessels to a gentle heat until it falls into powder. This is generally done near the place where the pavement is to be laid. While still hot it is taken in iron carts to the place and spread in an even layer upon the surface

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.* My attention was called to this subject, but I was unable to see any experiments or to devote any time to an investigation of its merits. The above notice is based upon information received, and in part upon the treatise of Francois Coignet, "Emploi des Bétons Agglomérés." 8vo. Paris, 1862. Eugene La Croix, Editeur.

of the concrete, which must be quite clean and smooth. It is only necessary to spread the warm powder evenly, and then to tamp it by means of large flat-faced irons, which are first heated in a portable furnace near by. In this way a perfectly smooth, even surface is given to the asphalt, and in two hours it is as hard as stone, and horses may be driven upon it. It is usually compressed before being used, by passing over it a heavy roller weighing from two thousand five hundred to three thousand kilogrammes. It is then as smooth as any floor and presents a continuous unbroken surface of stone. The thickness of this layer is usually from one and one half to two inches, and it is estimated that the wear is not more than a millimetre per annum, or less than the one thirty-second part of an inch. This seems almost incredible, but it is evident from the nature of the surface that it must wear a long time, for there are no joints or inequalities to jar the wheels of passing vehicles, which roll over it with the greatest ease and almost without noise. It is found, also, that horses do not slip upon this pavement as easily as upon stone. The asphalt can be taken up at any time and be relaid, for it does not lose its property of softening by use. So, also, a new piece of pavement may be perfectly joined to an old layer by simply heating the edges with hot iron.

Among its other advantages, it is impervious to water, and may be used for roofs, or for lining cisterns. It is said that a similar material was used in Memphis and Babylon some thousands of years ago.

Such material would be invaluable in California, and it is highly probable that it occurs in the Coast ranges.

Bitumen is also used to a considerable extent for the sidewalks of Paris, but it is mixed with the asphaltic rock so as to form what is termed *mastic d'asphalte.*

This is prepared by heating from ninety to one hundred kilogrammes of bitumen in an open boiler, and when the mass is quite liquid and at or near the point of volatilization, the asphaltic rock is thrown into it, little by little. This rapidly falls into powder and mixes with the bitumen. The operation is continued until the mass becomes pasty, and then somewhat friable and begins to stick to the sides of the vessel and to the arms of the agitators. Six hours is required for the heating and mixing. It is then run off and cast into molds so as to form circular cakes or discs about one foot in diameter and four inches thick. In this form it is sent to Paris to be used for the pavements and for other purposes. The mixture contains nearly one hundred parts of bitumen and fourteen hundred of asphalt.

The compound is used not only for sidewalks, but for forming tight joints between stones in damp places and to prevent the infiltration of water through the masonry of arches, to line cisterns and reservoirs for water, and as a substitute for brick or tile floors in public buildings. For the sidewalks of Paris it is mixed with gravel in the proportion of twenty-three of mastic to fifteen of gravel. The mastic is melted in a portable sheet iron boiler mounted on two wheels, so that it can be readily moved from place to place by one horse. It is cylindrical in form, and the rear end has a fire-box like that of a locomotive, and the flames and smoke circulate under the boiler and escape at the other end through a sheet iron chimney about six feet high. Their capacity is ordinarily equal to about nine square metres of pavement. A little bitumen is added to aid in the liquefaction or fusion of the mastic, and when it is all melted the clean and dry gravel is thrown in. The pavement is usually made with a layer of concrete from two to four inches

thick, on which the mastic and gravel is spread to a depth or thickness of one half to three fourths of an inch. Each square metre of sidewalk so covered requires:

Material.	Kilogrammes.
Asphaltic mastic	23.0
Gravel	15.0
Bitumen to aid the melting	1.5

And the price, including a bed or layer of concrete four inches thick, is six francs to the square metre. The following table shows the price in Paris of the asphalt, the asphalt mastic, and the principal works in bitumen of Val-de-Travers:*

Asphalt and works in bitumen.	Francs.
Asphalt rock, per metric quintal	7.00
Asphalt in powder, per metric quintal	8.00
Bituminous mastic, in cakes, per metric quintal	11 00
Bitumen, refined, per metric quintal	40.00
Sidewalks, barracks, etc., one half inch thick, per square metre	4.25
Pavements, on a slope, per square metre	6.50
Covering vaults, per square metre	5.50
Roadways in mastic, or pressed asphalt, per square metre	13.00

* For this table and a part of the foregoing data I am indebted to M. J. Claudel, "Pratique de l'Art de Construire."

CHAPTER VII.

MINING MACHINERY.

It is the general expression of mining engineers and experts who visited the Exposition, that the display of mining machinery was not as large and interesting as there was reason to expect. One explanation of the disappointment may be found in the fact that the objects exhibited were scattered about in the vast assemblage of machines in the outer circle, or were placed in the outbuildings of the Park. If all had been brought together in one place, the display would have been considered much more satisfactory. There was, however, very little that was new and striking. There is no great improvement or advance to record—scarcely anything that has not been already described in mining and engineering publications. Some of the most important of late improvements in dressing machinery were not represented at all; such, for example, as the continual working *stossherd* of Rittinger, and his other various contrivances for sizing pulverized ores before concentration. The California pan machines, concentrators, etc., which form the bulk of our mining exhibits at the exhibitions of the Mechanics' Institute, were not to be found in the Exhibition, nor a stamp mill or the parts of one. In fact, there is not one in Europe comparable with ours for perfection of construction or in working effect. The bulk of the exhibit, however, consisted of the very machines in which we on the Pacific Coast are most deficient and behind the rest of the mining world, namely: hoisting machinery.

The various objects exhibited may be classed under the following heads:

First—Mining tools.
Second—Rock perforators or drilling machines.
Third—Boring tools for wells or shafts.
Fourth—Hoisting engines and apparatus.
Fifth—Cables.
Sixth—Cages and wagons.
Seventh—Machines for crushing and dressing ores.

MINING TOOLS.

Under this head are included drills, hammers, picks, blasting implements, lamps, etc. The tools of Germany and Austria were shown in their respective sections, and were displayed upon the walls above the maps and sections of mines. All of the drills are characterized by their extreme lightness, as compared with American tools of the same kind. Round bar iron tipped with steel, or round steel, is used instead of octagonal bars. The picks, however, are more heavy and clumsy than ours, and are not so well mounted. There is no wood so well adapted to the purpose as our hickory, and in no other country is so much pains taken as with us in fashioning the handles of common tools. Some turned pick-handles from Australia, made of the hard woods of that country, may be cited as an exception.

The various mining costumes sent may be appropriately noted here—although a detailed description is impossible. In the Chilean section the heap of copper and silver ores was permanently presided over by a figure of a miner with one foot resting upon a block of the ore. In the Austrian section two figures displayed the peculiarities of the German miner's dress, including, of course, the fanciful cap and the leather apron placed behind. In the Park of the French section a complete miner's cottage gave a view of the home comforts of the French collier, and at the same time served the purpose of exhibition of the great variety of coal mining tools and mining lamps placed around the room.

ROCK DRILLING MACHINES.

There was more of novelty under this head than any other. There were machines for drilling holes, driven either by the force of compressed air or by water under pressure; machines to drill one hole, or to drill several at the same time, or to cut an annular groove or channel around a central core of rock in opening tunnels. To describe all these machines would be to give a long chapter of the experience at the tunnel of Mount Cenis. The machine of General Haupt attracted much attention in France and in England, and was noticed by the General himself at the meeting of the British Association at Dundee. He claims to have achieved a perfect success in the application of steam to tunnelling, and he makes out a very strong case against the advocates of compressed air, by showing what an enormous force is required to force it to great distances in pipes of ordinary diameter. He proposes to mine in true military style by throwing up breastworks in front of a blast, so that the miners need not lose time by retreating at the word "fire," but stand and face the shots like heroes. This may suit military miners, but it will be a long time before we can find any better and cheaper protection than a cross-cut or side drift.

The drilling machine was tested in Cornwall last Summer, but is said not to have given the expected satisfaction to the Cornishmen.

In the Swedish section, the boring machine of Bergstroem was at work upon a mass of hard iron ore. It is said to be in successful use at the Perseberg iron mines of Sweden, and to have replaced hand labor in drilling, with a saving of twenty to twenty-five per cent. in cost. This machine is worked by compressed air, weighs only one hundred and twenty-two pounds, and costs about one hundred dollars. It is small and compact, and is supported in place by set-screws bearing against the top and the bottom, or against the sides of the tunnel.

The Swedish machine is the most portable and compact which has been shown, but we are promised something still better by Darlington, of England, who will use the pressure of a column of water to operate the drill. His machine will be shortly introduced to the notice of California miners, and it has this great recommendation for them, that it is very light and cheap, and is to be operated by water alone, and does not require any engine or expense for installation.

In the French section, Messrs. Huet & Gayler showed a perforator, the invention of M. de la Roche Tolay and M. Pirret, which operates upon the hardest rocks by means of rough diamonds set firmly in the end of a long, hollow cylinder, about as large as a gun barrel. The cylinder thus armed is made to revolve rapidly and is brought against the rock by the pressure of water. The diamonds at the end form a kind of "crown saw," and they cut the rock, whether limestone, sandstone, granite or flint, into powder. This powder is removed by a constant stream of water, which at the same time keeps the drill cool. An annular channel or opening is thus made in the rock, and the central core of rock passes into the hollow of the drill, and breaks out when the drill is withdrawn. The diamonds last a long time before they show wear, and when they lose their cutting angles they are turned over in their setting. The tip of the drill in which they are set is attached to the cylinder by a bayonet joint, and can thus be changed with facility.

This is also known as the "Leschot drill," and the same or a similar drill has been used to drill holes at least four inches in diameter in the oil regions of Pennsylvania.

It is claimed that with this drill and the apparatus which has been noticed, holes may be drilled in quartz at the rate of over half an inch per minute under a pressure of eight hemispheres and one hundred turns per minute. In mica slates the advance is about an inch and a half. With the same pressure and a velocity of two hundred and fifty turns per minute, the progress in quartz is increased to one and one-third inches per minute.

COAL CUTTING MACHINE.

A machine is shown in the English section for under-cutting coal beds or blocking out masses of coal. It is operated by compressed air, and will cut a channel only two or three inches wide and two feet or more in depth. It is said to be in successful operation in England and to effect a great saving over hand labor, not only in work but in coal also, as there is not so much waste.

Another machine, shown by Messrs. Carrett, Marshall & Co., of Leeds, is so contrived as to plane or gouge out a groove in the coal by means of strong steel cutters, mounted one behind the other on a strong bar of steel, to which a reciprocating motion is given. The tool is forced against the coal by hydraulic pressure, and there is no percussion and but little noise.

The colliers of South Lancashire and Cheshire have offered prizes of five hundred, two hundred and one hundred pounds sterling for the first, second and third best coal cutting machines.

TOOLS FOR BORING SHAFTS.

It is unnecessary to describe the various forms of augers and drills for boring artesian wells displayed in the French section. They are not superior to those now in use with us for sinking oil wells. But there is

another class of boring tools used for opening shafts in soft ground or in stratified formations that can be easily perforated and where quantities of water are encountered.

These tools are enormous reamers or drills from ten to sixteen feet across the face, so that they will open circular shafts of the same dimensions. They are made of wrought iron and weigh many tons. A massive cross head is armed with stout steel cutters like teeth, set in rows at the outer ends and projecting downwards. A small guide hole being first bored into the earth, these larger tools are made to follow and enlarge it. At the same time the shaft is lined by a water-tight curbing or cylinder of wrought iron, made in short sections one bolted upon another by means of flanges, which are suspended and descend as the shaft progresses. The lower section is made double, and the space is so filled in with moss or tow that when the boring is completed and the weight of the iron curb or lining is allowed to rest upon the moss it is pressed outwards against the sides of the shaft, and thus, by making a tight joint, excludes the water from the shaft. It will be observed that the whole of the lining, including the double portion and packing at the bottom, is kept suspended as the boring progresses, and is not allowed to rest upon the bottom until the desired stratum is reached and a firm foundation is cut in it by the boring tool. During the whole operation the shaft is full of water, and it is not pumped out until the lining is finally secured in the shaft.

Two pits have been sunk in this way at St. Arold, through very watery ground, and with a very great saving of time and expense. In one of the pits the curb was fixed at a depth of five hundred and twenty-three feet, and the coal was reached at a depth of one thousand and thirty-six feet. It is probable that this ingenious method of sinking shafts may be adopted with advantage in the lower portions of the Mount Diablo coal field, where the strata are full of water and are not too hard to be easily bored. The credit of the invention and perfection of this method is due to Messrs. Kind & Chudron, and they received a grand prize.

MACHINES FOR EXTRACTION.

Hoisting engines and apparatus were found only in the French and Belgian sections. In the former, the most conspicuous was a machine with double vertical engines, and the winding reels or bobbins high in the air above them. This was from the establishment of Quillac, at Anzin, which has turned out a large number of powerful engines of similar construction for the French coal mines. They claim to have supplied sixty-seven machines, of the aggregate horse-power of seven thousand and twelve, since eighteen hundred and fifty-six. One of five hundred horse power was for pumping. The cylinders of the engine in the Exhibition were about three feet diameter and six feet stroke. They were connected directly with the bobbin shaft above, without gearing. This shaft carried two bobbins, twenty-two feet in diameter, intended for flat wire or hemp cables. The wooden arms of these bobbins are united at their extremities by segments of iron. The engineer stands on an elevated platform and looks under and between the bobbins towards the mouth of the shaft. The movement is controlled by link motion, and the brakes are operated by steam. The poppet heads, pulleys and frame work, to be placed over the mouth of the shaft, together with the cages, guides and wagons, were shown in connection with the engines, and the whole formed the most complete and attractive looking hoisting appa-

ratus exhibited; but it is questionable if this vertical arrangement is so desirable as the horizontal. Another hoisting apparatus in the Belgian section had the bobbins placed below the cylinders, the shaft being on the level of the floor, and the cylinders inverted above it. The engineer of the machine stands above the whole, and has an unobstructed view of the shaft and the pulleys above it.

There were also two or three beautifully finished horizontal hoisting engines, all of them double and direct acting upon the bobbin shaft. Some of the bobbins were provided with light wrought iron segments to connect the spokes. Most of the machines had friction bands suspended around a central or outer wheel, made specially for the purpose. These bands were operated by steam. Other machines had brakes instead of metal bands. These were merely segments of wood set in iron frames and drawn forcibly against the opposite sides of a friction wheel, on the main shaft, by means of levers also operated by steam. The power varies from eighty to one hundred and fifty horses.

These machines all had a very light, airy appearance, and were somewhat in contrast with another machine shown in the Park, in the building devoted to the productions of the great establishment of Creuzot. This was made for the coal mines of Blanzy, to perform very heavy work, and is very strong and solid. It is horizontal, double engines and direct-acting. The cylinders are very long, and are placed some twenty feet apart. The bobbins are for flat cable and are twenty feet in diameter; the spokes are not connected by metal rims, but are left disconnected at the outer ends. There is a separate steam cylinder for working the breaks. It is a notable fact that winding and pumping engines have been made by Quillac, at Anzin, France, for English coal mines in Newcastle, and the explanation is, simply, that the French are able to furnish satisfactory and highly finished engines at lower prices than English establishments require.

CABLES.

Some very heavy and well made flat wire cables were shown in the French and Belgian sections. In the Belgian, some were made of ordinary round wire cables, one inch in diameter, and united side by side, and were long enough for mines two thousand eight hundred feet deep. It is claimed that this is an improvement over the usual mode of laying the flat cables, and that it permits more rapid winding. I did not see, however, any better samples of light wire rope work than those shown in the United States section by A. S. Hallidie & Co., of San Francisco.

CAGES AND WAGONS.

The system of using cages of several stories, so as to take wagons one above another, is being abandoned, as much as possible, for the broad cage, to receive the wagons upon the same level. This, of course, necessitates a larger shaft, but the saving of time, trouble and wear is very great over the other method.

Nicholas Libotte, of Belgium, exhibited some very well made cages, made wholly of steel, intended for the mines of a coal company near Liege, Belgium. They are made to take two tiers of wagons, three on each, or six wagons in all. The cage weighs one thousand two hundred and sixty-eight kilogrammes (about two thousand five hundred and thirty-six pounds), and the parachute attachment three hundred and twenty-

eight pounds. Another cage is constructed to take six wagons, one above another—total weight, including parachute, three thousand one hundred and twenty-four pounds. The wagons intended for this cage are about six feet long and two feet six inches wide. The guides in the shafts are intended to be made of wood, and the slides or bearings on the cage are made of steel. All the cages shown were provided with safety parachutes, not differing particularly from those already often described. The great advantage of these steel cages is their lightness, compared with those made of iron of equal strength.

CRUSHING AND DRESSING MACHINES.

The only ore crushers shown were Blake's rock breaker, and the well known Cornish rollers; the former, being exhibited by the assignees of the patent in France, was in the French section, and received a gold medal. The same parties showed self-acting and discharging jigs, modifications of the Cornish machine, with the grates fixed and the water forced up through them and the ore by a plunger. These are made entirely of cast iron, and were operating very well upon lead ore. A table for dressing fine ore was made of an endless belt of canvas, which moves in a direction opposite to the flow of the ore, and at the same time receives a shock or percussion. With the exception of the percussion, the arrangement is very similar to one tried by Mr. Williams, at the Benton mill, some years ago, and abandoned as unsatisfactory.

CHAPTER VIII.

WINES AND FERMENTED DRINKS, ALCOHOL, BEET ROOT SUGAR, VINEGAR, MUSTARD AND CHICCORY.

WINES OF THE UNITED STATES.

The display of wines and fermented liquors of all kinds, from various parts of the world, was enormous, as will appear from the following enumeration:

Countries.	Exhibitors.
France	600
Spain	316
Portugal	121
Algeria	142
Prussia	119
Switzerland	82
Italy	479
Brazil	85
South Australia and Victoria	32
The United States	33

With this vast amount of work before the Jury, it is not surprising that the wines of the United States, including those of California, did not receive more attention. In the United States exhibit, besides the Californian wines, there were samples of the sparkling and still Catawba wines and brandies from Cincinnati, Ohio; red and white wines from Pennsylvania, sparkling Catawba from grapes grown in the State of New York, and other wines from Ohio, Indiana and Missouri. Honorable mention was made of the sparkling wine sent by the Buena Vista Vinicultural Society of Sonoma, R. N. Van Brunt, Secretary, San Fran-

cisco, which appeared to have been much liked, as two cases of it were nearly consumed in the trials by the experts.

In order to remedy the disappointment of the United States wine exhibitors, the United States Commission appointed a Committee to specially examine American wines and make a report. This Committee consisted of Mr. Flagg of New York, Marshall P. Wilder of Boston, and Dr. Jacob Thompson. The American wines were placed in their charge, and were tasted from time to time. The report of this Committee will be made to Congress, with the other reports of the Commission, and will probably be printed at some distant day.

Complaint has been made about the placing of these wines—that they were heated and fermented, etc. This is probably a mistake, for in July and August there were no signs of fermentation. It is true that the wines were not put into the coolest possible place, but the flues spoken of by some were several feet distant, and would hardly be noticed by most persons. The bottles were placed cork up, except the champagnes, as was the case with the other exhibits throughout the Exhibition.

This habit of heating the wine recalls the discovery made by the French chemist, Pasteur, of the existence of invisible vegetable growths in wines, which cause fermentation or disease, destructive of the good qualities. This discovery was made by the aid of the microscope, and is another example of the practical value of the instrument. M. Pasteur has also shown that the germs of this vegetable growth can be destroyed by simply heating the wine in closed vessels to a temperature of sixty degrees centigrade, for only a few minutes. Numberless experiments have confirmed the discovery, and have proved at the same time that the operation does not injure the flavor of the wine, but, on the contrary, very often improves it. I had the pleasure of tasting some of the wines which M. Pasteur had treated, and found the difference very marked in favor of the wine that had been heated, except in one instance. These wines were brought by M. Pasteur to a chemical entertainment at the laboratory of the illustrious St. Claire Deville.

The researches of Pasteur have been published in a beautiful volume, by Victor Masson, and are entitled "Etudes sur le Vin."

The same chemist is now busily engaged in investigating the disease of the silkworm, by the aid of the microscope. He finds that the germs of the disease may be detected in the eggs. Diseased eggs may therefore be thrown away. His method consists merely in grinding up samples of the eggs in a mortar, and placing a little of the paste under the lens. The same method has been extended to the testing of the bodies of the millers that lay the eggs.

WINE AND FERMENTED DRINKS IN FRANCE.

The following valuable data upon the product and consumption of wines and alcohol in France are extracted from the Introduction to Class Seventy-three, in the Official Catalogue:*

"Viticultural production is one of the most important in French agriculture. It extends over two millions two hundred and eighty-seven

* This Introduction was prepared by Comte Herve de Kergolay, President, and Louis Baral, Delegate, of Class 73.

thousand eight hundred and twenty-one hectares,* situated in eighty-one departments, the yield being on an average fifty million hectolitres, of a total value to the producers of seven hundred and fifty million francs. In eighteen hundred and sixty-five the quantity reached sixty-eight millions nine hundred and forty-two thousand nine hundred and thirty-one hectolitres; and, considering the development that has taken place during the last few years, it is certain that unless checked by the grape disease (the oïdium) the amount of fifty million hectolitres will generally be exceeded. Vineyard property is excessively subdivided. It is held by no less than two millions two hundred thousand proprietors, so that each property on an average scarcely exceeds one hectare. The cost of cultivation varies considerably, according to the season and the rate of wages in the various districts of France. They range from one hundred and fifty francs to five hundred and seventy francs per hectare, which gives for the rate of wages from one franc and ninety centimes to four francs and even five francs per day. The trade in wine is of course a very considerable one. The City of Paris alone consumes annually about three millions six hundred thousand hectares; that is to say, an average of one hundred and eighty-three litres (a litre is rather more than one and three fourths pints) per head for each inhabitant, and this consumption would certainly go on increasing largely if it were not impeded by the present system of taxes, and by their heavy rates. The city, or *octroi*, duties, for instance, exceed in amount the value of the greater part of the wine on which they are placed. Exportation increases every year, under the influence of the new treaty of commerce. In the year eighteen hundred and sixty-six the exports amounted to three millions one hundred and ninety-four thousand one hundred and four hectolitres, of the value of three hundred and eight millions five hundred and two thousand francs, while in eighteen hundred and fifty-one the total value did not exceed one hundred and ninety-five millions nine hundred and twenty-three thousand francs. Thus in five years there has been an increase to the extent of sixty per cent. The value of the exports of spirits and liquors amounted in eighteen hundred and sixty-six to ninety-three millions nine hundred and seventy thousand francs, while in eighteen hundred and sixty-one it had not reached over fifty-two millions nine hundred and sixty-six thousand francs. It had, therefore, increased to the extent of eighty per cent. in the same period. The total amount of the exports of wine and spirits in eighteen hundred and sixty-six was, then, four hundred and two millions four hundred and seventy-two thousand francs. In eighteen hundred and sixty-six the prices were far below those of eighteen hundred and sixty-five. This reduction of price, combined with the changes introduced into the English tariff, which made the duty on wine introduced in bottle the same as that imported in the wood, has increased the exports of wine from France to England from ninety-four thousand three hundred and eighty-five hectolitres to two hundred and five thousand nine hundred and ninety-two hectolitres; that is to say, an augmentation of one hundred and twenty per cent. between eighteen hundred and sixty-five and eighteen hundred and sixty-six; and it is hoped that this consumption will overcome the obstacles which arise out of the organization of trade in England and the great number of local taxes.

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* A *hectare*—nearly two and a half acres; a *hectolitre*—twenty-two and a half gallons.

"Sixty-five Departments have taken part in the Exhibition of eighteen hundred and sixty-seven; they are represented by six hundred exhibitors. Unfortunately, the exhibition of the great growths of the Bordelais is far from being complete. As to Burgundy, the Chamber of Commerce and the Agricultural Societies and Committees have zealously competed in the organization of a most remarkable exhibition. Two thousand four hundred bottles of wines were sent from Burgundy, as follows:

Districts.	Bottles.
From Villefranche	600
From Macon and La Chapelle de Guinchay	400
From Chalon	200
From Beaune	400
From Dijon	200
From Avallon	50
From Auxerre	400
From Yonnerre	400
From Joigny	50

"Various processes have been proposed and experimented on recently with the view to the improvement and management of the fermentation of wine, and particularly to make it capable of bearing changes of temperature and more especially long sea voyages; but the most important improvement to be noticed is certainly that of an illustrious chemist, M. Pasteur. [Already noticed]

"The production of alcohol in France has averaged, during the last ten years, one million one hundred and twenty-four thousand eight hundred and seventy-two hectolitres; but the increase has latterly been very considerable. Thus the season of eighteen hundred and sixty-three and eighteen hundred and sixty-four produced one million two hundred and seventy-eight thousand one hundred and ninety-two hectolitres; eighteen hundred and sixty-four and eighteen hundred and sixty-five, one million three hundred and five thousand nine hundred and five; eighteen hundred and sixty-five and eighteen hundred and sixty-six, one million seven hundred and eighty-nine thousand four hundred and seventy-four, which is divided as follows:

Distilled.	Hectolitres.
Distillation of wine, 12,000,000 hectolitres, giving in alcohol.	1,010,166
Beet root	283,022
Molasses	307,409
Farinaceous substances	79,648
Lees and fruits	53,232
Various substances	55,997
Total	1,789,474

"The average annual production of cider during the past ten years has been nine million fifty-seven thousand five hundred and seventy hectolitres; in eighteen hundred and sixty-six it was eleven million three hundred and twenty-three thousand seven hundred and forty-five hectolitres, and it increases every year. The railways contribute largely to this result by transporting rapidly the cider apples from the place of production to the centres of consumption. The consequence is that the price of apples has been augmented, and that the farmers find it worth their while to extend their plantations. The consumption of cider is also larger than it was, because in many districts where nothing but water was drunk, they now make use of cider or beer. The best cider in France is made in the neighborhood of Calvados and La Manche, but it is desirable that the proprietors should bestow the same amount of care upon the cultivation and manufacture as the wine growers.

"We have previously said that the consumption of beer increases considerably in several parts of France, where its use was very restricted a few years since. In other localities its use extends even where wine or cider is the common drink of the country. The manufacture has made great progress, and we no longer go to Germany or England for light, agreeable or wholesome beer.

"This development of the brewing trade has produced a similar progress in the cultivation of hops in the Northern and Eastern Departments, and the Vosges and Alsace. At the present time French hops are in as great demand as the best Bavarian hops, and they might pass for them in commerce."

BEET ROOT SUGAR.

Beet root sugar in France is made chiefly in the Northern Departments. The product is about two hundred million of kilogrammes, and about the same quantity is imported from the French and foreign colonies. The consumption is about two hundred and fifty million kilogrammes and the difference is exported. The manufacture and refining of beet root sugar has made great progress since eighteen hundred and fifty-seven, and it has consequently been produced at a lower price. The customs duty upon beet sugar is forty-two francs per one hundred kilogrammes.

The principal improvements in the manufacture of sugar are: The process of double carbonization, triple action vacuum pans, the use of centrifugal machines; and in refining, the improvements in the system of bleaching, and the employment of centrifugal machines.

Within the last five years beet root sugar of superior quality, made by the aid of the improved apparatus of Cail & Co., has been used in the manufacture of confectionery. Sugar of this kind is worth about one hundred and seventeen francs per one hundred kilogrammes.

A great variety of sugar making apparatus was exhibited—such as machines for removing stones, rasping machines, mills, presses, tissues for sacks, filtering presses, apparatus for evaporating the juice in vacuo, either single, double or triple. There was also a variety of centrifugal machines and furnaces for reheating the animal charcoal used to decolorize the solutions. One of the rasping machines shown by M. Champonnois makes seven hundred revolutions a minute and rasps over thirteen thousand pounds of beets in an hour.

The stimulus given to the production of beet roots in Prussia and elsewhere by the large and cheap production of potash salts suitable for

manure, at Stassfurt, has already been noticed in the chapter upon useful minerals.

A novel practical application of endosmose to the concentration of saccharine liquids has been made by Dubrunfaut, and Messrs. Carmichel & Co., refiners of sugar and distillers, at St. Clair de la Tour-du-pin, exhibited an apparatus for the purpose, which is stated to have been in successful operation at their establishment for three years. It was not accompanied by a description, but its mode of action was quite plain to those familiar, by experiment in the laboratory, with the laws of endosmose and exosmose. The apparatus appears like a great cubical box about four feet square, but it is made up of a series of sheets of vegetable parchment stretched upon frames and placed side by side, so that they are not more than one inch apart. By passing through these membranes the solutions are gradually concentrated. This is called the Osmogene process.

VINEGAR, MUSTARD, CHICCORY.

The best vinegar in France is made from the white wines of the Loire and of the Charente. The preparation consists in fermenting these wines by heat applied by steam or otherwise under reservoirs constructed for the process. Machinery is used to transfer the liquid from one vessel to another. The researches of Pasteur have thrown light upon many points which were before obscure. The annual production is about one million five hundred thousand hectolitres, worth, at twenty francs, about thirty million francs or six million dollars. The price varies with the season, from five francs to twenty francs per hectolitre.

The annual product of mustard in France is about six hundred and fifty tons, worth one hundred and fifty thousand francs. Mixed with condiments and vinegar, and ground in mills, it is made ready for the table, and the annual value of the production is estimated at two million francs. It is cultivated chiefly in the Northern Departments.

The preparation and use of chiccory as a substitute for coffee was a result of the continental blockade, but its use has continued and is increasing. It is cultivated in the northern part of France, and in the Haut and Bas Rhin.

The green roots are worth from four and a half to five francs the one hundred kilogrammes. They are roasted and dried in large establishments, and are reduced to powder. The sliced and dried roots are worth from eighteen to twenty-four francs. The prepared powder is worth from forty to fifty francs the one hundred kilogrammes. The annual product is estimated to be seven thousand tons and to be worth from three million five hundred thousand to four million francs.

LIST OF EXHIBITORS

OF OBJECTS FROM CALIFORNIA AT THE PARIS EXPOSITION.

Names and Articles Exhibited.	Group.	Class.
MISSION WOOLLEN MILLS, San Francisco, Lazard Fréres, Agents. Four cases of woollen goods, manufactured in California from California wool	IV	30
C. H. HARRISON, San Francisco. Centrifugal pump	.....	.....
C. E. WATKINS, San Francisco. Series of twenty-eight large photographic views of Yosemite Valley, and two of the Big Trees of the Mariposa Grove	II	9
LAWRENCE & HOUSEWORTH, San Francisco. Twenty-six large photographs of Yosemite Valley and of the Great Trees, and three hundred stereoscopic views of different localities in California	II	9
EDWARD VISCHER, San Francisco. One case containing six portfolios of views in California and Washoe	II	9
A. S. HALLIDIE & Co., San Francisco. Samples of wire rope, round and flat, and iron and copper sash cords of California manufacture	V	40
PACIFIC GLASS WORKS, San Francisco. Specimens of California made glass bottles	III	16
JOHN D. BOYD, San Francisco. One highly finished ornamental door, made of wood grown in California	III	14
JOHN D. BOYD, San Francisco Specimens of the wood of the Madrona, or California laurel	V	41
JOHN REED, San Francisco. Premium tank lifeboat model, four feet long	VI	66
SAN LORENZO PAPER MILLS. Varieties of paper made at the company's mills in Santa Cruz, California	.....	.....
STANDARD SOAP COMPANY. Specimens of California made soap and washing powders	.....	.....

Names and Articles Exhibited.	Group.	Class.
D. L. Perkins, San Francisco and Oakland. Collection of seeds grown in California, and a photograph of California vegetables. (Donated to the Imperial Garden of Acclimatation.)	VII	67
J. W. H. Campbell, San Francisco. One case—about one hundred and twenty pounds—California high mixed wheat. (Donated to Royal Agricultural Society, England)	VII	67
J. D. Peters, San Joaquin County. One box containing about thirty pounds of wheat	VII	67
Buena Vista Vinicultural Society (by R. N. Van Brunt, Secretary). Cases of sparkling wine made from grapes grown at the Society's vineyard, Sonoma County, California, eighteen hundred and sixty-five	VII	73
C. H. Le Franc, New Almaden Vineyard. Four cases of red and white wines made in San José, California	VII	73
Sansevain Brothers, Los Angeles. One case of California wine	VII	73
Kohler & Frohling. California wines	VII	73
M. Keller, Los Angeles. Four cases of California wines.	VII	73
A. Fenkhausen, San Francisco. Three cases California wine and bitters	VII	73
Taylor & Bendel, San Francisco. One case of stomach bitters	VII	73
Dr. J. Pigné, San Francisco. Six cases of California and Nevada minerals and ores. (Donated to the School of Mines, Paris)	V	40
California State Agricultural Society. Volumes of the Society's reports for distribution	V	40
William P. Blake, San Francisco. Collection of California minerals and ores. (See list of minerals and ores.)	V	40
Drs. Harkness and Frey, Sacramento. Large mass of silver ore from Blind Springs, Mono County, California, weighing about one hundred pounds	V	40

LIST OF MINERALS AND ORES

SENT TO THE PARIS EXHIBITION FROM CALIFORNIA BY THE STATE COMMISSIONER.

NOTE.—The names of donors of specimens for the collection are given after the names of the specimens. When not otherwise stated, the specimens were from the private collection of the Commissioner, or were collected by him for the Exhibition.

Exhibit.	No.
Bituminous coal, Pittsburg mine, Mt. Diablo, California	1
Bituminous coal, Independence and Eureka mine (710 feet deep) Mt. Diablo, California. Greenhood & Newbaur	2
Brown coal, Cowlitz River, Oregon	3
Bituminous shale, Isthmus of Nicaragua, New Granada	4
Native sulphur, Tehama County, California. R. G. Sneath	5
Native sulphur, Colusa County, California	6
Sulphur, manufactured, Colusa County, California	7
Native sulphur, Cañada Larga, Santa Barbara County, California	8
Rock salt, native, in large crystals, Virgin River, Arizona. Winegar & Shaw	9
Rock salt, manufactured, Los Angeles County, California. Winegar & Shaw	10
Rock salt, ground in water, Los Angeles County, California. Winegar & Shaw	11
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METEOROLOGICAL REPORT.

BY THOMAS M. LOGAN, M. D.,

METEOROLOGIST TO THE STATE BOARD OF AGRICULTURE.

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To the Board of Agriculture of the State Agricultural Society:

As is well known, California has virtually but two seasons, viz: the Winter, or wet season, and the Summer, or dry season. The proper adaptation of agricultural operations with the former contributes more to the success of the farmer than every other circumstance connected with meteorology. For this reason, we have arranged, up to the present time, our series of rain tables for the last eighteen years, carefully corrected and revised, commencing with September and ending with August of each season. In the following table will be found the quantity of rain that falls in each month, the total for each season, and the mean monthly and annual supply. As every additional season adds to the value of these tables, by bringing the general averages nearer to a constant, so it becomes necessary to recapitulate, in a measure, our former deductions, in order to make the resulting corrections in the right place:

RAIN TABLE FOR SACRAMENTO DURING EVERY MONTH FOR EIGHTEEN YEARS.

MONTHS.	1849–50....	1850–51....	1851–52....	1852–53....	1853–54....	1854–55....	1855–56....	1856–57....	1857–58....	1858–59....	1859–60....	1860–61....	1861–62....	1862–63....	1863–64....	1864–65....	1865–66....	1866–67....	Mean .....
September.....	0.250	0.000	1.000	0.000	0.003	sp'kle	sp'kle	sp'kle	0.000	sp'kle	0.025	0.063	0.000	0.000	0.003	0.004	0.080	0.000	0.079
October.....	1.500	0.000	0.180	0.000	0.005	1.010	0.000	0.195	0.655	3.010	0.000	0.914	sp'kle	0.355	0.000	0.120	0.480	0.001	0.468
November	2.250	sp'kle	2.140	6.000	1.500	0.650	0.750	0.651	2.406	0.147	6.485	0.181	2.170	0.005	1.490	6.718	2.427	2.426	2.133
December.....	12.500	sp'kle	7.070	13.410	1.540	1.150	2.000	2.396	6.632	4.339	1.834	4.282	8.637	2.327	1.815	7.867	0.364	9.511	4.870
January.....	4.500	0.650	0.580	3.000	3.250	2.670	4.919	1.375	2.444	0.964	2.310	2.668	15.036	1.733	1.077	4.776	7.699	3.440	3.504
February	0.500	0.350	0.120	2.000	8.500	3.460	0.692	4.801	2.461	3.906	0.931	2.920	4.260	2.751	0.186	0.712	2.010	7.104	2.648
March.....	10.000	1.880	6.400	7.000	3.250	4.200	1.403	0.675	2.878	1.637	5.110	3.320	2.800	2.360	1.303	0.481	2.018	1.010	3.207
April.....	4.250	1.140	0.190	3.500	1.500	4.320	2.132	sp'kle	1.214	0.981	2.874	0.475	0.821	1.693	1.080	1.370	0.476	1.805	1.656
May	0.250	0.690	0.300	1.450	0.210	1.150	1.841	sp'kle	0.203	1.037	2.491	0.590	1.808	0.355	0.742	0.460	2.252	0.008	0.881
June.....	0.000	0.000	0.000	0.001	0.310	0.010	0.033	0.350	0.098	0.000	0.017	0.135	0.011	0.000	0.087	0.000	0.100	0.000	0.064
July	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.030	0.549	0.000	0.000	0.000	0.000	0.004	0.018	0.000	0.033
August.....	0.000	0.000	0.000	0.000	sp'kle	0.000	0.000	sp'kle	sp'kle	0.000	0.000	0.000	0.006	0.000	0.085	0.000	0.000	0.000	0.005
Totals.....	36.000	4.710	17.980	36.362	20.068	18.620	13.770	10.443	18.991	16.051	22.626	15.548	35.549	11.579	7.868	22.512	17.924	25.305	19.550

Our climate is seen to have seven months in which it always rains more or less, viz: from November to May inclusive, and five in which it seldom rains, and then for the most part lightly. December furnishes more rain than any other month; January next; then March, February, November, April and May. In February, which may be called our first Spring month, there is generally an interruption of precipitation, especially during very rainy seasons, and the interval of dry weather about this time would seem to divide the season into the early and latter rains. These last are quite as constant though not as copious as the former, observing, however, the same tendency. According to the amount of rain in the first half, so will be the proportion in the second half of the season. The rainfall for the year in California varies somewhat in different localities. That observed for Sacramento gives a tolerably correct criterion for judging the rainfall of all the interior valleys, that of San Francisco being one fourth greater, and that of Nevada and the Sierra Nevada Valleys, three times as much. The annual mean of nineteen and a half inches insures a good harvest, while any considerable excess of this quantity causes damages by floods, which prove destructive to the economy of the farmyard, as in the seasons of eighteen hundred and forty-nine and eighteen hundred and fifty, eighteen hundred and fifty-two and eighteen hundred and fifty-three, and eighteen hundred and sixty-one and eighteen hundred and sixty-two. A fall of less than two-thirds of this mean annual rain causes short crops, and induces a drought more or less destructive to cattle. The drought in consequence of the diminished rainfall of eighteen hundred and sixty-three and eighteen hundred and sixty-four caused the destruction of from one-third to one-half of the cattle and sheep that range in the lower valleys of the State. It has been suggested in the annual report of our State Board of Agriculture that seasons of drought may be in a measure prevented, or at least ameliorated by a general system of arboriculture. In the present state of our knowledge it cannot positively be affirmed that the presence or absence of trees affects the total annual quantity of rain, though the balance of testimony strongly favors the conclusion that more rain falls in wooded than in open countries. It is a well established fact, however, that forests, not only by means of the moisture which they produce and condense, but likewise on account of the obstacles they impose to evaporation from the soil and by the action of their roots in rendering soils permeable, insure the permanency and regularity of natural springs, and this, too, not only within the limits of the wood, but at some distance beyond the borders. "As the forests are destroyed, the springs which flowed from the woods, and, consequently, the greater water-courses fed by them, diminish both in number and in volume. This fact is so familiar throughout the American States and the British Provinces that there are few old residents of the interior of those districts who are not able to testify to its truth as a matter of personal observation." "My own recollection," says the author of a recent valuable treatise on physical geography,* "suggests to me many instances of this sort, and I remember one case where a small mountain spring, which disappeared soon after clearing the ground where it rose, was recovered about ten or twelve years ago by simply allowing the bushes

*Man and Nature; or, Physical Geography as Modified by Human Action. By George P. Marsh.

and young trees to grow up on a rocky knoll, not more than half an acre in extent, immediately above it, and has since continued to flow uninterruptedly. The uplands in the Atlantic States formerly abounded in sources and rills, but in many parts of those States which have been cleared for above a generation or two, the hill pastures now suffer severely from drought, and dry seasons no longer afford either water or herbage for cattle."

M. Becquerel has recently brought this interesting question before the French Academy. The first portion of his paper gives details respecting the extent of forest land in France at various periods; the second discusses the climatic action of forests, and in it he states that their influence will be found to depend on their extent, the nature of the trees, whether having deciduous or permanent leaves, on the power of evaporation exerted by the leaves, and on their capacity of receiving or radiating heat, and, lastly, on the character of the soil and subsoil. The general conclusion from this and other discussions respecting the "*deboisement*," or destroying the trees of a country, seems to be that, although the mean temperature may be unaltered, the distribution of heat at given times may be affected so as to produce a modification of climate. Certainly the leaves are a powerful and incessant cause of moisture in the air, the least reduction of temperature occasioning, as we have already stated, a precipitation of the moisture evaporating from them, and which, on falling, penetrates the soil directly, when it is permeable, and through the intervention of the roots when it is not.

In connection with these inquiries, Professor Tyndall's researches on the action of atmospheric humidity in arresting radiation, so admirably brought within our reach by J. S. Lippincott in the report of the United States Commissioner of Agriculture for 1865, should be studied by every intelligent agriculturist. Up to the present time sufficient attention has not been paid to the influence of the soil when unprotected by trees. The temperature of a soil varies according to whether it is dry or moist, calcareous, sandy or clayey, and experiments show that two soils, one wet and the other dry, exposed to solar radiation, will differ forty-three or forty-five degrees when the air temperature is seventy-seven degrees; and for humus (vegetable mould) the difference will sometimes be as much as fifty-four degrees. The physical character of the soil is likewise important; and land covered with flints does not cool so fast as sand, and silicious soils are on this account found better for vines than chalky or clayey soils, which cool quicker.

With these facts and considerations before us, we cannot but indorse the opinions expressed as to the ameliorating effects of arboriculture on our climate, by affording shelter against our drying north and northwest winds and by contributing to the supply of an element essential to both vegetable and animal life. We would therefore reiterate, from the report last referred to: "Plant, then, trees; teach your children to plant trees and to love them. Again I say, plant trees; and if you can find no other time to plant trees, arise at midnight and plant them."

CULTURE AND PRODUCTS OF THE VINE.

REPORT TO THE UNITED STATES COMMISSION

AT THE

UNIVERSAL EXPOSITION OF PARIS, IN 1867.

CULTURE AND PRODUCTS OF THE VINE.

REPORT

TO THE UNITED STATES COMMISSION AT THE UNIVERSAL EXPOSITION AT PARIS, IN 1867, OF THE COMMITTEE ON THE CULTURE AND PRODUCTS OF THE VINE.

The exhibition of wines at the Universal Exposition of eighteen hundred and sixty-seven was large. Every wine growing country in Europe, as well as Australia, Canada, California and other sections of North and South America, were represented. As there were no jurors from the United States, our American wines were not subjected to so full and fair an examination as they were entitled to, and to remedy this omission a special Committee, consisting of the undersigned, was appointed by the Board of Commissioners to make an examination of the wines of our own and other countries, and to report especially with reference to wine growing in America. To properly judge, however, of the different kinds, of the qualities, cost, sanitary influence and adaptability to our country —points upon which we would have been glad to report more fully— would require more thorough tasting and more time than the Committee could command, or had a right to demand from the courtesies of foreign exhibitors or Commissioners.

As regards French wines, full reliance cannot be placed on what is furnished to the American traveller at hotels or cafés, or even what is sold to him at the shops, no matter what price he pays. It would, however, be doing Freneh wines a great injustice to judge them by the qualities sold in this way or exported to America. The great body of American consumers have palates as yet so unskilled, and the merchants of Bordeaux and fabricators and imitators are so adroit, that it seems impossible for the honest wine grower here to come into such relations with the wine drinkers there as shall secure to the latter the benefits, sanitary and moral, which the French people themselves derive from the pure juice of the grape so abundantly produced in this country. It is not an unusual practice for dealers to buy of producers in the back

country a coarse, deep red wine for thirty cents per gallon and a strong white wine for forty-five cents per gallon, mix and bottle them and send them abroad labelled with all the high-sounding names of "Medoc," to sell at enormous profits to unsuspecting foreigners.

Further south than Bordeaux, in the country about Montpelier and Bezires, an inferior article, but perfectly pure, can be obtained of the producer at five and six cents per gallon, or one cent per bottle. Of late years, and since the abatement of the grape disease, the production of France has been very large, the four millions of acres in cultivation yielding an average of one billion two hundred millions of gallons, which would give to every man, woman and child in the country, a half bottle full every day, even after allowing two hundred millions of gallons for exportation.

Owing, perhaps, to the intimate relations between America and Germany, our wine commerce with that country is conducted in a much more satisfactory manner. A good deal of excellent German white wine now makes its way to us, and is highly appreciated.

Hungary, whose product is second to that of France only, can supply a wide range of varieties, and at prices extremely reasonable. As the Hungarian producers seem to know, as yet, but little of chemistry, we suppose their wines to be generally pure, and as they are not yet fully introduced into the markets of the world, we should think they might be advantageously purchased to a greater extent than has yet been done.

Besides the sherry, of which we consume so largely, Spain has an abundant and rich vintage with which American consumers would be better acquainted if her merchants had more of the enterprise of those of Bordeaux.

Portugal also produces plenty of excellent and pure wines of which we know little, for hardly a drop is allowed to leave the country without being so strongly brandied as to lose its character as a wine, and become rather a spirituous liquor. Port wine is repeatedly dosed with spirits until it contains as much as twenty-four per cent. of alcohol. Fifteen years age is required before it is fit to drink, not because the wine is slow to ripen, but because the spirit needs to remain fifteen years before the disturbance it causes can subside and the antagonistic ingredients of the mixture harmonize.

Notwithstanding bold and persistent assertions to the contrary, it has been satisfactorily proven to your Committee that the adulteration is made not to preserve the wine, but solely to make it sweet and stimulating.

As America is destined to become a great wine-producing country, her people ought to be better acquainted than they are with the higher grades of foreign wines; but they have as yet drank so little of these, that their standard of excellence remains comparatively low. Now, except in California, none of the European vines will grow in America, and we are compelled to search in our forests, and develop in nurseries and vineyards the varieties which are in the future to be our reliance for competing with foreign producers, and finally, it is to be hoped, emancipating ourselves from them altogether. Of course, then, the higher our standard of taste is, that is, the higher our aim, the better will be our success. Our vine growers have much more to learn of the character and quality of good wines than they have of cultivation and manufacture, for really, as to the preparation of the soil, planting, cultivating, pruning and training the vines, gathering, selecting and pressing

the fruit, fermenting and keeping the wine (white wine, at least), our experienced vignerons have but little to learn of European rivals.

Our American vineyards compare very well with those of France, and so do our cellars, presses and casks, so that an elaborate report on methods would be of but little benefit, and might even mislead, for there seems to be no one method in use here, in any stage of vine-raising or wine-making, concerning which there is not a confusion of practice and a conflict of theory, such as it would be hopeless to attempt to reconcile. Probably sound reasons for much of this diversity may be found in peculiarities of soil and varieties of vines that are local and special, and with which we have nothing to do. Still, a pretty thorough tour among the vine districts of France has not been wholly barren of suggestion.

SOIL AND EXPOSURE.

The soil of Medoc, where stand "Chateau Margeaux," "Chateau La Fitte" and "Chateau La Tour," is a bed of coarse gravel, among whose pebbles the eye can barely detect soil enough to support the lowest form of vegetable life. In the vicinity of Bezires, on the other hand, the land is rich and strong enough to yield any kind of a crop; yet Medoc grows wine that often sells for ten dollars a gallon, while that of Bezires sometimes sells for the half of ten cents per gallon. In Burgundy there is a long hill, on whose dark red ferruginous limestone sides a wretched thin covering of earth lies, like the coat of a beggar, revealing, not hiding, the nakedness beneath. Here stand little starveling vines, very slender and very low; yet here is the celebrated "Clos Vaugeot," and this is the hill, and these are the vines that yield a wine rivalling in excellence and value that of Medoc, and to the fortunate proprietor the *Cote d'or* is what it signifies, "a hillside of gold." At its base spreads out a wide and very fertile plain, covered with luxuriant vines, whose juice sells from ten to twenty cents per gallon.

If you go further northward and examine the hills of Champagne, you will find them to be merely hills of chalk; and these instances only illustrate the rule derived not from them alone, but abundance of others, that, for good wine, you must go to a dry and meagre soil. Yet we should be sorry to have to extend the rule, and say that the poorer the soil the better the wine, for there are certainly very few patches of ground in America that can match in poverty the mountains of Champagne, the hills of Burgundy, or the slopes of Medoc; nor would it do to conclude that manure should not be applied, for although some say it is hurtful to the wine in its quality, it is yet an open question whether this is so or not. Meanwhile the practice is to manure, although sparingly.

PREPARING THE GROUND, PLANTING THE VINES.

This is probably as well understood in America as in France. We usually break up to the depth of two feet and drain thoroughly. In many parts of France they trench to the same depth, but in many other parts this is impracticable, unnecessary or injurious. Here, the distance between the vines is from eighteen inches to two feet, according to their size. We, however, are compelled, by the greater vigor of our vines, to place them five and six feet apart.

In Burgundy, Champagne and some other districts it is the practice to renew the vigor of the vines by laying down the cane and rooting the plant in a new place, which quite breaks up the original lines so the

plough cannot be used. This is doubtless a good way to renew the strength of the plant, but it is objected to by high authority, on the assumption that the older the stalk is the better the wine will be; on the other hand, Champagne wine dressers have attributed to this practice, in a great measure, their almost total exemption from the vine disease.

But then, again, others attribute that exemption to the general and long established custom of spreading over the vineyards a bituminous shale containing sulphur, a well known antidote; and here we would recommend most strongly to our countrymen a renewed and sustained effort to combat mildew with sulphur. The experience of France and other countries is entirely in its favor, and its use is still felt to be necessary and is still kept up.

We think Americans have not been thorough enough and patient enough. Let them try again, and this time let them begin early and be sure to follow carefully these rules on the subject, which have been hitherto much better promulgated than observed. On rich and level land a common plan in some districts is to set out double rows of vines at wide intervals, in fields chiefly devoted to other crops. The free exposure to sun and air thus secured seems largely to augment the yield, and this will be understood by any one who has noticed the superior productiveness of such of his vines as grow bordering on a wide alley or other open space. This is very different from planting vegetables, etc., among the vines, which is a bad practice.

WIRE TRELLIS.

These are becoming quite popular here, as we think they are in America also, notwithstanding the cheapness of wood. The size of wire preferred is number sixteen, and but two wires are used. Our large vines would need three wires. They are stretched to strong posts set twenty feet apart, passing intermediately through holes of smaller posts or stakes. On the lower line, about eighteen inches from the ground, the fruit-bearing wood is trained, while the upper line, about eighteen inches above the other, supports the new wood. Many prefer to allow the fruit-bearing cane to do service two years instead of one only, as is the practice in America. There is no doubt that with wire trellises the pruning, tying, pinching off, etc., can be much more cheaply done than where the training is to stakes, and from the way the clusters depend from the horizontal cane it is easy to see that there must be also a superior access of sun and air, and a greater ease in gathering the vintage.

It is a common practice to go through the vines with a plough every Fall and throw up a good ridge of earth against the stalks. The Hungarians have a more effectual way of guaranteeing against the cold of their rigorous Winters, which is to lay the vines on the ground, cover them with straw, and on the straw throw the earth; without this it is said they could produce no wine at all. Our native grapes are generally hardy, and will live wherever their fruit will ripen, but occasionally there is a severe season which seems to touch the very heart of the wood and so enfeeble it that it falls an easy prey to disease. It was noticed that the mildew set in with great destructiveness after the two hard Winters of eighteen hundred and fifty-four and eighteen hundred and fifty-six.

The thorough covering employed in Hungary would secure it against such occasional risks, and also might render it possible to grow Euro-

pean vines in our country. By its means, too, we could, perhaps, make the "Scupper" live in our Northern States, and obtain from it a sparkling wine of foam and flavor unsurpassed. From these considerations and others we recommend to the wine growers of our more Northern States to lay down and thoroughly cover their vines regularly every Fall; and to those in milder regions to bank up the earth against the stalks as is done in France.

We have derived most of our instruction in vine dressing from the Germans, in whose native country there are no sunbeams to spare, and the celebrated Risling grape is said to hardly ever ripen; and thus, perhaps, we have been led to attach too much importance to letting the fruit remain on the vine as long as possible before gathering. If we have been in error it would be well worth while to know it, for besides the loss by shrinkage, the ravage of insects and birds, quadrupeds and bipeds, during the last fortnight of the vine dressers' watchings, is most disheartening. Now it is contended by good authority in France that early vintages are best, and that it is important, not merely in regard to quantity but quality, also, to gather the fruit before it becomes over ripe. Possibly what is true of white wine may not be so of red wine, to which last named kind attention is so widely directed in Europe. Here the proportion of white wine to red is very small, and it may be said that red is the rule and white the exception.

Our wine growers in America understand very well the principles to be observed in the manufacture of white wine, and many of them, as regards care and nicety, are as good models as need be desired. But it cannot be denied that the practice of selling the ripest and finest grapes for table use and converting the unsalable into wine prevails to a great extent among American vineyardists, and the result is the manufacture of much inferior wine. This has already injured the reputation of American wines, both at home and abroad. Of the much more complicated process of making red wine, however, American manufacturers are but little informed, for the reason that until recently they have had no grapes suitable for the purpose; but now that we have discovered those excellent varieties, the Morton and Ives seedlings, our estimate of the value of which has been greatly raised by comparing wine from them with some of the highest grades of foreign productions, a few observations of methods of fermentation for red wine as practiced in France may be appropriate.

In France they will make either white or red wine from the same grape; but in America they have grapes whose pulp is so rich in coloring matter that they yield a very pretty tinted wine without any further treatment than what is given to make white wine, and a pure white wine cannot be made from them; of this kind is the Morton seedling. Yet not for beauty alone do they put them through the process of fermentation on the skin, but because that process imparts qualities which, as affecting the palate, stimulation, digestion, etc., are quite different from what the other process imparts. Many persons find red wine essential to their health who cannot use white wine, and *vice versa*.

STEMMING.

The fruit having been gathered and selected, the next thing to do is to stem it. In Medoc and all the Bordelais this is invariably done. But in Burgundy and other districts they commonly omit it, and throw stem

and all into the vat. If, however, the season has been bad, and the stems remain unripe, they are of necessity excluded in whole or in part, lest they do more harm than good. The chief reason for putting in the stems is to correct the disease called "teitter," for which the turrin acid, etc., of the stem is thought to be an antidote. Fortunately we know comparatively little, as yet, of any wine disease except acidity; but still it will remain for us to decide, upon experience, which of the two methods it is best to adopt. Probably we shall arrive at the same diversity of practice as is witnessed here. Stemming is usually done by rubbing the fruit upon a grating of iron rods, but the better way decidedly is a grating of wood. It is made of bars two thirds of an inch square, carved into each other where they cross so as to bring them down to an even face, leaving openings or meshes two thirds of an inch square. This is established like a table with four legs, with a rim around it about ten inches high, and a proper receptacle beneath to receive and carry off the stemmed fruit as it falls through and the juice which escapes. The table is four feet square and four feet high. About three bushels of grapes are put on to the grating, which four men with bare arms soon rub through, leaving the stems behind, which are then thrown into a small circular press like our hand cider presses, which extracts the juice of the few grains remaining on them. In this way four men can stem enough to make fifty barrels of wine per day. For one who makes but a small quantity, a deep tub and a three-pronged stick will do very well.

CRUSHING.

This is next to be done, by trampling the grape with the naked foot. It is said to be a better way than to use a large mill, for the reason the mill will crush the seed; but the seeds are not easily crushed, and a properly made grape mill need not bruise them in the least. At a well managed wine-house—that of Messrs. Averons Brothers, in Paulliac—they put the grapes to ferment with no further crushing than what is given them in the process of stemming, which experience has satisfied those gentlemen is all that is needed.

Treading out grapes with bare feet is well enough if the feet first be made clean; but probably no American will ever adopt the plan of crushing with naked feet, either clean or unclean, but will either rely on the crushing given in the stemming process, or use a mill, or a bucket and tripod.

FERMENTATION.

The crushed mass, with or without the stems, is next thrown into vats and allowed to ferment. The vats are large casks, generally without bulge, the largest at the bottom and open at the top. In some of the large houses they are covered with loose boards; in others the boards are jointed and made hermetically close by plastering with cement or clay; in others there is merely a floating mass of stems; and in others there is no covering at all except the scum of stems, skins, seeds, etc., which rise to the surface.

After the fermentation has ceased and the wine becomes clear, it is drawn off and put away in close casks, which in France are almost uniformly of the size called "barrique," holding about fifty gallons. In Burgundy these are kept above ground and in the light until Spring, and then put into cellars, while in the Bordeaux country they remain in the light in storehouses above ground until one or two years old, and

then removed to dark rooms on the same level. A careful way of making red wine out of grapes not fully ripened is to allow it to remain in the vats for a sufficiently long time after fermentation to let the greenness held in suspense settle to the bottom.

At La Tour, in the vintage of eighteen hundred and sixty-six, they allowed the wine to remain in the vat a whole month, though the fermentation was probably complete in half of the time. After drawing off the remaining undissolved pomace it is pressed and made into a wine of inferior quality. It is common in France, and it would be sometimes necessary in some parts of America, to provide means of warming the wine house up to at least twenty degrees of Centigrade, or about forty-nine degrees of Farenheit, as well as to introduce steam heat into the vats themselves, which is done by means of a tin pipe, entering to the right of the faucet and a little above the bottom of the vat, bending to the bottom and rising again in the form of a letter U, and then passing out at the other side of the faucet, at the same distance from it, the steam entering at one end and the condensed vapor escaping at the other; but heat is only applied in cold seasons and when the grapes are badly ripened.

In France, the fruits of different varieties are commonly mixed together, and generally but little account is taken of *cesaye* (variety) as compared with the quality of soil. Well informed persons, however, are disposed to complain of the introduction, which has been quite general of recent years, of coarse varieties grown for quantity rather than quality.

There is one variety of vine commonly seen on rich soil and deemed unfit for poor ground, except where grown for brandy, as in Cognac, that may possibly be of value to us. It is called "la folle" (the crazy), "en ragatt" (from enraged). Except in its infancy it needs no stakes, but holds itself erect by the strength of its stalk, which is trained about one foot high, and from which the cane or branches shoot out with great vigor, like those of the osier willow pruned low. Every Winter all the branches are cut back to two or three eyes, and during the season the ground is cultivated in the usual manner, but further than this it demands no attention. There is no Summer pruning, nor any tying Winter or Summer. It is never hurt by frost, is proof against all disease and is unfailing in its fruiting, and yields, when in good condition, twelve to fifteen gallons of wine per acre. Its most favorable soil is a sandy loam, and when grown on such its wine, which is quite strong, is worth forty cents per gallon. Of that produced about Bordeaux a good deal is mixed with coarse red wine and made into claret for American consumption. Of itself it will not make red wine. It is possible that this hardy vine or grape will stand our severe Winters, and, with or without Winter covering, obtain a footing in American soil. If so, every farmer or whoever else can command a quarter of an acre of land might raise for his own table an abundance of good sound wine at a trifling cost. Generally it is a bad policy to introduce a coarse plant of any sort, but we have so vast a spread of land that is too rich for growing delicate wines, no matter what variety of plant is tried, and of late the mildew and rot have been so discouragingly fatal in many parts of our country, it might be well to give the "en ragatt" a trial; and, since we must drink the juice baptized with the names of St. Julien, Chateau Margeaux and all the saints of Medoc, we may as well enjoy the satisfaction and the very large profit of raising it ourselves.

Not only do the French mix different kinds of grapes in the vat and on the press, but they freely compound together different kinds of wine in every stage of maturity. This is done, of course, with great carefulness, the success of the merchant in his business depending on his skill in concocting what will please the palate. Such combination may be agreeable to the taste of the consumer, and profitable to the merchant, but it may well be doubted if it is as good for the health as that which is simply natural and made from one variety of grape.

A French wine grower has introduced the Catawba into his vineyard, and uses its juice to mix in very small proportions with that of native grapes to give flavor. Any considerable addition of the Catawba's musky quality would be more than the French palate, trained to like only that which is negative, could very well bear.

When American wines were tested by the Jury at the Exposition, the French jurors, whose scale was from one to four, with a zero at the foot, generally complimented our Catawba with a zero, and they remarked that the more of the natural flavor the wine possessed, other things being equal, the lower they should estimate it. In America the very contrary is known to be the case. The German jurors, accustomed to wines of high bouquet, held quite different opinions from the French, and were much pleased with the American samples.

In regard to the more delicate wines of Europe which do not bear exportation, an important discovery is said to have been made by the distinguished chemist Pasteur, of the Institute, which is exciting great interest, and promises nothing less than to secure wine against disease and deterioration for an indefinite period, to enable it to be transported with safety any distance, and kept in any sort of storehouse. The best way to make known in America the discoveries of Mr. Pasteur would be to translate and publish his very valuable work, entitled "Etudes Sur le Vin," sold by Victor Masson & Sons, Place de l'Ecole de Medicine, Paris. Meanwhile we will give a brief synopsis of it:

After explaining at length the nature of the different diseases of the wine, acidity, bitterness, etc., tracing them all to vegetable parasites, and detailing his experiments in search of an agent to destroy the parasites, Mr. Pasteur arrives at the conclusion that they are effectually destroyed by heating the wine up to a point between fifty and sixty-five degrees of Centigrade, which would be between one hundred and twenty-two degrees and one hundred and forty-nine degrees of Fahrenheit. The heating can be done in a "Bain Marie," that is, by placing the bottle or cask in a vessel filled with water and heating the water, or by hot-air closets or steam pipes introduced into the casks. The heating should be gradually and carefully accomplished in order to enable any one to test the value of this invention, so important in its aims.

We extract the following, which gives all the author has to say on the mode he has himself followed with wine already in bottle, whether new or old, diseased or sound:

"The bottle being corked, either with the needle or otherwise, by machine or not, and the corks tied on like those of champagne bottles, they are placed in a vessel of water; to handle them easily, they are put into an iron bottle-basket. The water should rise as high as the ring about the mouth of the bottle. I have never yet completely submerged them, but do not think there would be any inconvenience in doing so, provided there should be no partial cooling during the heating up, which might cause the admission of a little water into the bottle. One of the

bottles is filled with water, into the lower part of which the bowl of a thermometer is plunged. When this marks the degree of heat desired—one hundred and forty-nine degrees of Fahrenheit for instance—the basket is withdrawn. It will not do to put in another immediately; the too warm water might break the bottles. A portion of the heated water is taken out and replaced with cold, to reduce the temperature to a safe point, or, better still, the bottles of the second basket may be prepared by warming, so as to be put in as soon as the first comes out. The expansion of the wine during the heating process tends to force out the cork, but the twine or wire holds it in, and the wine finds a vent between the neck and the cork. During the cooling of the bottles, the volume of the wine having diminished, the corks are hammered in further, the tying is taken off, and the wine is put in the cellar, or the ground floor, or the second story, in the shade, or in the sun. There is no fear that any of these different modes of keeping it will render it diseased; they will have no influence except on its mode of maturing, on its colors, etc. It will always be useful to keep a few bottles of the same kind without heating it, so as to compare them at long intervals with that which has been heated. The bottle may be kept in an upright position; no mould will form, but perhaps the wine will lose a little of its fineness under such condition if the cork gets dry and air is allowed too freely to enter."

Mr. Pasteur affirms that he has exposed casks of wine thus heated in the open air or terrace, with a northern exposure, from April to December, without any injury resulting.

Wine in casks may be heated by introducing a tin pipe through the bunghole, which shall descend in coils nearly to the bottom and return in a straight line and through the pipe imparting steam. If, after thus being once heated, there is such an exposure to air, as by drawing off and bottling, as to admit a fresh introduction of "parasites," the disease thus introduced may be easily cured by heating a second time.

Mr. Pasteur claims also to have discovered and proved that wine can be advanced in ripening and improved by "æriation" conducted by a slow and gentle manner. This is a bold assertion, but such confidence is felt in the value of suggestions coming from him that both of his methods, cutting, as they will, a tangle of old theories, will have a fair trial by his countrymen, and that without delay.

Your Committee would say, in conclusion, that from what comparison we have been able to make between the better samples of American wines now on exhibition at the Paris Exposition, with foreign wines of similar character, as well as from the experience of many European wine-tasters, we have formed a higher estimate of our own ability to produce good wines than we had heretofore; and from our investigations in vine culture we are now more confident than ever that America can and will be a great wine growing country. All that is necessary for us to rival the choicest products of other parts of the world will ere long come with practice and experience. We have already several excellent varieties of the grape borne on American soil, and suited to it a soil extensive and varied enough for every range of quantity and quality. Who would discover a patch of ground capable of yielding a "Johannesberger," a "Tokay" or a "Margeaux" need only make diligent and careful search, and, somewhere between the Lakes and the Gulf and the two oceans that circumscribe our vineyard territory, will be sure to find it.

Accompanying this report is a paper from William Griffith, of Pennsylvania, on the propagation of the vine, referred to us. This is deemed of such importance as to justify its publication entire without comments on the subject by your Committee.

Finally, your Committee cannot close this report without acknowledging the many courtesies extended to them by European exhibitors and Commissioners in facilitating the investigations incident upon the discharge of their duties.

MARSHALL P. WILDER,
ALEXANDER THOMPSON,
WILLIAM J. FLAGG,
PATRICK BARRY,
Committee.

SUPPLEMENTAL REPORT.

The Committee, since making their report on the third branch of the subject given them in charge, have visited the principal vine districts of Switzerland and Germany, and deem some of the observations there made worth being embodied in the supplemental report now submitted.

The vineyards to which attention was more especially given were those of the borders of Lake Geneva, those of Pfalz or Rhenish Bavaria, and of the banks of the Rhine, the Neckar, and the Main.

With regard to the quality of the soil, we have the same remark to make here as was made in the former report—namely, that the vines yielding the best wine were found to be growing on the poorest soil. Geologically, the soil throughout all the above districts is very much the same—namely, basalt and sandstone, both formations usually seen in close proximity, the basalt uppermost and resting on the other. The only exceptions were a few patches of limestone and slate. The basalt soil is esteemed richer than the sandstone, and is often hauled on to the other to enrich it. For instance, the vine dressers of Durkheim actually manure their thin, poor, gravelly land with tens of thousands of yards of earth, brought from the neighboring town of Deidesheim, and yet the Durkheim wine is quite superior to that of their neighbors. All this was quite different from anything we noticed in France; there, calcareous rocks seem to underlie everywhere, nor could we learn of any wine of high repute in France that derived its quality from sandstone or basalt. The vine husbandry of the Swiss and Germans is of the first order. Nowhere do you see in their vineyards the straggling appearance so common in those of France (the effect of frequent layering), but the lines were always beautifully true and even. Although the intervals or rows were wide enough for the plough to pass, nearly all the cultivation was done by hand, and done most thoroughly, too. In France, as in America, they stir the ground two or three times during the season. In the Rhinegan it is done four times; but about Forst Deidesheim and Durkheim they do it as often as every two or three weeks from the beginning to the end of the season. It is in the above neighborhood that basaltic earth is applied as a manure, as is also clay, to make the ground more retentive of manure; and this they do to such an extent

that old vine fields are seen which have been raised visibly above the level of the others adjoining them.*

The expenditure of labor in a year on an acre of those fields amounts to about one hundred and forty days work. In the Pflaz, it is usual to train upon horizontal laths or lines of wire running fifteen inches above the ground, very much as is done in Medoc, only that where wire is used a second line is stretched above the other. If the plan is good in Medoc and Pflaz, it is hard to see why it would not be good everywhere, especially in countries so cold as Germany and the northern part of the United States. Indeed, Mr. Guyot, to whose book we have already referred, argues strongly in favor of everywhere adopting the method of training the fruit-bearing vine horizontal with the ground and very close to it. We ought, however, to note here that the fields where this mode was more particularly noticed, or connected with good results, were in gravelly deposits of nearly level surface. Manure is freely used in Germany, much more so than in France, and is prepared and applied with much care and system. Cow manure, largely composted with straw, is the only kind thought fit to manure vines. They sprinkle the heaps almost daily to keep them moist, and allow the mass to rot at least twelve months before being used. It is applied every three years. As to quantity, it is certain that some soil, like the poor and unretentive gravel beds of the Pflaz, should receive more than those of the neighboring slopes, and that the calcareous earths of France need less than the sandstone and the basaltic earths of the Rhine Valley.

Guyot, arguing strongly in favor of manure, recommends the French cultivator to put on at intervals of three years a quantity of manure that will be equivalent in weight to that of the fruit he has taken off at vintage, while Mr. Herzmansky, the steward at Johannesberg, who tills some fifty acres of vines, keeps about forty very large cows in his stables. But will not manuring hurt the quality of the wine?

In our former report we say that this is an open question as yet, and so it is in France, and Mr. Guyot treats it as such in arguing upon it. Of course none will doubt that were a vineyard to be treated in this respect as we treat the soil of a grapery, very poor wine would be produced; and the only question is, will a moderate quantity do harm? This is precisely the question the Committee put to Mr. Herzmansky, the intelligent and thoroughly experienced director at Johannesberg, where the best wine in the world is made. His answer was: "No. As we apply it on this soil it does not impair the quality of the wine in any degree; on the contrary, it improves the flavor." Then he led the way to his well-ordered cow stables, and pointing to the compost heaps, remarked: "There is the beginning of Johannesberger."†

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* Some years since the vineyard of F. T. Buhl, of Deidesheim, produced wine on the natural soil of a very inferior quality, selling at fifty centimes the litre, at a very great expense. The whole vineyard was covered to the depth of three feet by volcanic or basaltic earth brought from a distance of several miles. The experiment at the time was thought to be a very hazardous one, but the enhanced value of the wines after the addition proved that the owner was wiser than his neighbors.

† The vineyard of F. T. Buhl, alluded to in the above note, is fertilized by a compost made of wood ashes, stable manure and earth. This is applied in the Spring in trenches dug to the depth of about ten inches and again covered with earth; the application is made in this manner to every alternate row of the vineyard. The following year the same process is gone through with in the remaining rows, by the removal of the soil as previously stated and the treatment of manure as just detailed. This vineyard now produces wine of a very superior quality, of a delicious bouquet, rich in saccharine matter and alcohol, and possessing all those excellences that we prize in a first class wine, and is readily selling at twelve francs the litre. To which is this wine most indebted for the extraordinary change in its character, to the volcanic soil or the manure which is annually buried in the vineyard?

Now, Johannesberger is the most delicate of wine, as it is indeed superlative in every respect. By the kind invitation of the Princess Metternich the Committee were allowed to taste specimens of the best the castle cellar contained, including some that was twenty-one years old in the cask, and some from a cask that was, *par excellence*, called the "Bride of the cellar," and the opinion formed was that the quality of Johannesberger is such that it cannot be described and can be communicated only to the organs of taste, nor can it be understood or even imagined except by those who are so highly favored as to have a taste of it. But this marvellous wine is but the crowning product of the famous district of the Rhinegan, or that portion of the valley lying just north of Mayence, a strip of less than ten miles in length, whose fruit yields a juice which surpasses all others of the world, combining richness with flavor and delicacy with strength. The soil of the Rhinegan seems to be of a red sandstone mostly, if not wholly. Johannesberg Hill reminds one strongly of the soil of some parts of New Jersey and Connecticut; and in the neighborhood of New Haven, in the latter State, the basalt is seen resting upon the red stone, just as it does upon the hills that skirt the Rhine. Nearly all the German and Swiss wines, and indeed nearly all the grapes grown in Germany and Switzerland, are white, for which the soil and climate of the former country seems peculiarly adapted, while at the same time unsuited for ripening colored grapes to the tint needed in a true red wine. The peculiarity of the better sort of Rhenish wines is bouquet, and of the inferior sort, acidity. Compared with them their French rivals are quite negative, and so are those of Switzerland. A French wine, white or red, must be very poor indeed if it shows any acidity, and must be very fine indeed if it possesses any easily tasted bouquet. Altogether, we must award the palm of excellence to the white wines of the Rhine, as we do to the skill and industry of the vine dressers who produce them. In considering the merits of the different soils as geologically distinguished from each other, we seem drawn to the conclusion that so far as our observation has gone the red sandstone is the superior one; but we confess ourselves unfit to make any such sweeping generalization, and will only say that the soil in question, for aught we can see, seems as fit as any other to grow a superior wine. The difference between wine made by fermenting the bruised grapes, juice, skin, pulp and seeds altogether and called red wine, and that made by pressing immediately after gathering, and fermenting its pressed juice by itself, called white wine, is not a difference of color alone. For certain bodily temperaments and for certain conditions of health—possibly, too, for the peculiar constitution of the German people—white wine may be the best. And to that of the Rhine country Leibig attributes the virtue of being an antidote for calculus and gout. But all this being admitted, the better reasons seem to favor the production and use of the red wine in preference to the white, where it can be done. The testimony we have obtained from the best sources of knowledge on this point amount to this:

Red wine is much less heating, much more tonic, much less exciting to the nerves, much less intoxicating to the brain, and its effects are more enduring than white wine. As we of America are, by reason of our dry climate, as well as from moral causes, more excitable, both from brain and nerve, than the Europeans, and at the same time much oftener in need of tonic diet, and our Summer heats are so much more intense than in the wine latitudes of Europe, all the above considerations should have peculiar weight with us. So highly, at least, do the French peo-

ple appreciate them that they consume now little white wine, and it bears always a lower price in the market than red of equal quality. To the general consumption of this drink intelligent Frenchmen are apt to attribute the fine health of their peasantry, as well as their habitual gayety and habitual temperance. (The habitual use of whisky has quite another effect.) An American gentleman, for many years residing in France, and for a time a Professor in one of the Universities, affirms that the greatest longevity is among those people who take red wine three times a day and abstain from both tea and coffee. When Americans consult French physicians, three times in four they are ordered to drink red wine as a habitual beverage, and one of the commonest daily events among Americans residing in Paris is the cure of an obstinate dyspepsia by the same simple remedy, even in the unhealthful air of that city.

The German vineyards have hitherto escaped any very serious ravages from the "vine disease." It is met as often as it appears, and successfully combatted with sulphur. Three applications are made, the first as soon as the berries have grown to be as large as the head of a pin. Early in the day, and before the dew is dried off, the flour is sprinkled on the lower surface of the leaves, where the moisture causes it to attach. The instrument used is a tube of tin, perforated with numerous small holes at the lower end, and with a tassel of woollen yarn attached to that end. At Rheims we were shown a large vine, trained to a wall, one half of which had been treated as above in the Spring of the year before and the other half neglected. The latter had, as a consequence, lost all its fruit, and we visited the place and saw it the following season. It showed yellow and falling leaves in July, and very little fruit, while the other portion was perfectly healthy, and was loaded with a good crop of fruit. This experiment was made by a French gentleman, who had recently returned from a long sojourn in America, and visited that country for the purpose of satisfying himself if the sulphur be really a preventive or not against the vine disease, of which he had heard so many doubts expressed while in America.

MARSHALL P. WILDER,
ALEX. THOMPSON,
W. J. FLAGG,
PATRICK BARRY,

Committee No. 9, United States Commission.

SILK AND SILK MANUFACTURES.

REPORT OF ELLIOT C. COWDIN,

UNITED STATES COMMISSIONER TO THE PARIS EXPOSITION.

SILK AND SILK MANUFACTURES.

REPORT OF ELLIOT C. COWDIN,

UNITED STATES COMMISSIONER TO THE PARIS EXPOSITION.

Hon. WILLIAM H. SEWARD,
Secretary of State, Washington, D. C.:

SIR: The undersigned, Commissioner of the United States, and member of the Committee "on raw materials and manufactures of great use or displaying remarkable skill or merit," to whom has been specially assigned the subject of silk and silk manufactures, respectfully submits the following report:

Silk, by its characteristic qualities and unchangeableness, as well as by the richness and beauty of its appearance, is in relation to textile substances what gold is to metals.

It is of all filamentary substances that which gives the finest, most durable and most elastic threads. Its tenacity is about equal to that of good iron; that is to say, a thread of silk of the same size will support nearly the same weight before breaking, and the textile matter affords an elasticity superior to that of the mineral substances.

Silk consequently unites the most brilliant properties with the most solid qualities. Its various, excellent and advantageous characteristics have made it an object of research in all ages by the different nations of the world.

China, even in our own day the most important country for the production of silk, appears to have been its cradle at the most remote epoch. The Chinese annals attribute to the Emperor Fau-Hi the merit of having employed silk in the manufacture of musical instruments of his own invention three thousand four hundred years before the Christian era.

The Empress Si-Ling-Chi was the first to invent silk tissues, two thousand six hundred and fifty years before our era, which invention contributed so immensely to the prosperity of her country that she was

placed among the Chinese divinities, under the name of Lien Thsan,* and even now the Chinese Empresses offer annually solemn sacrifices to her memory.

As it is the habit of the Emperor of China once a year to plough the earth in order to add dignity and honor to agricultural pursuits, so in like manner the Empress, by annually visiting the silkworm nurseries and laboring with her own hands, encourages the production of this valuable commodity.

Two centuries before the Christian era the Chinese carried on a commerce in silk with Persia, Greece and Italy. Their caravans or troups of dealers were protected by military settlements or colonies.

The generic name given to this precious material has remained unchanged except with a slight modification of the word. In fact, the French word *soie* or silk bears among them the name *sec*.

The Mongols name it *sirke*. The Mantchous, *sirche*. The Russians designate it by the word *chek*, and the Greeks by *sez*, etc.

Notwithstanding the antiquity of the use of silk, its nature was for a long time unknown, and the importation into the West was of recent date compared to its high antiquity in Asia.

The history of the introduction of the first eggs of the silkworm into Constantinople during the reign of the Emperor Justinian is well known.

The Chinese, determined to retain the monopoly of the silk industry, forbade the exportation of the eggs under penalty of death. They were, nevertheless, obtained A. D. five hundred and fifty-two, by two Persian monks, who had lived a long time in China as missionaries, and were acquainted with the rearing of silkworms. Stimulated by the gifts and promises of the Emperor Justinian, they succeeded in conveying a large number of eggs concealed in hollow canes to Constantinople, where they watched their hatching and the development of the butterflies. The breeding of silkworms spread, however, very slowly in Europe. The Moors imported them into Cordova about the year nine hundred and ten. Greece and Italy undertook it in the twelfth century; thence this branch of industry passed to Marseilles. At the commencement of the fourteenth century, Pope Clement V introduced it into Avignon. Under Henry IV, Sully established a silkworm nursery in the garden of the Tuileries. Louis XIV continued to encourage this enterprise in France, though with but little success, so far as relates to the production of cocoons and the spinning of silk.

The weaving of silk goods with foreign thread had, on the contrary, already made marked progress in France, and had a great development, which it preserved even up to the revocation of the edict of Nantes, after which period the weaving as well as the spinning of silk lost ground considerably.

The emigrants carried this beautiful industry into England, Germany and Switzerland, and raised the most active competition against France, where manufactures of silk remained in a languishing condition up to the close of the great revolution at the end of the last century, and until shortly before the return of peace to Europe.

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* This name means the first promoter of silk industry.

RISE AND PROGRESS OF SILK INDUSTRY IN THE UNITED STATES.

America has not been insensible to the efforts made by other nations to appropriate to themselves the production of silk.

During the early periods of the colonization of Virginia, James I, on several occasions, advised with and encouraged the London company in regard to the cultivation of the mulberry tree, and addressed a letter to the company, in which he enjoined its members and exhorted the planters to apply themselves with diligence to the breeding of silkworms, to establish silkworm nurseries and spinning grounds, and to devote their activity rather to the production of this rich commodity than that of tobacco, to which he manifested a profound aversion. Upon this advice, they planted a large lot of mulberry trees, but collected little silk, in consequence of the difficulties resulting from the speedy dissolution of the London company.

However, the culture of the mulberry tree was resumed in Virginia about the year sixteen hundred and fifty-one. The tree was indigenous in the colony, and the enterprise was so far advanced in sixteen hundred and sixty, that the coronation robe of Charles II was the product of the silkworms of Virginia. But the steady advance of tobacco culture caused the business so to decline that it seems to have almost disappeared by the close of the century.

During the eighteenth century, efforts were made to introduce silk husbandry into all the American colonies. It had been started as early as seventeen hundred and eighteen, with some success in Louisiana, then under the dominion of Spain. The most strenuous exertions were directed to Georgia. Private gifts co-operated with Acts of Parliament, and its settlers were stimulated by grants of land to cultivate the mulberry and raise silkworms. In seventeen hundred and thirty-two, artisans, skilled in this industry, were sent over from Europe. The French emigrant who had charge of the business proved treacherous, and destroyed the machinery, eggs and trees and fled from Georgia.

The Italian who succeeded him was more trustworthy, and some raw silk was soon exported to Europe. In seventeen hundred and thirty-five a beautiful robe was made in England of Georgia silk, which Queen Caroline wore on a great state occasion.

In seventeen hundred and forty-nine the export of cocoons reached one thousand pounds, and their product commanded the highest prices. A large silk establishment was soon erected in Savannah. The cocoons annually delivered to it, in the years from seventeen hundred and fifty-eight to seventeen hundred and sixty-six, inclusive, ranged from ten thousand to fifteen thousand pounds, and in the latter year they reached twenty thousand pounds. During the same period the annual export of raw silk ranged from five hundred to one thousand pounds. At this period the silk culture was one of the most flourishing and profitable in the colony. But its success was of short duration. After seventeen hundred and sixty-six, the governmental bounties were withdrawn, and this industry began to droop. The storm of the revolutionary war prostrated it. After peace, the planters of Georgia turned their attention to the growing of cotton, and silk culture utterly and finally disappeared.

The experiment in Georgia, its rise, progress and decline, are the history of silk culture in all the colonies. Brief notices of some other colonies must suffice.

In South Carolina, silk growing was prosecuted before the Revolution, and for a time flourished. The mother of the celebrated Pinckneys car-

ried some silk, produced on her plantation, to England, where it was woven into tissues. Gowns were made of it and presented by her to the mother of young George III, and the elegant Earl of Chesterfield. But the same cause that uprooted the business in Georgia destroyed it in Carolina. It passed away on the advent of cotton raising.

Silk husbandry received early attention in Pennsylvania and New Jersey. The British Government aided it by liberal bounties. Dr. Franklin, while in England in seventeen hundred and seventy, sent home mulberry cuttings, silkworms, eggs, etc., for distribution, and, with other influential citizens, gave it much encouragement.

In seventeen hundred and seventy-one, a silk establishment was set up in Philadelphia, which, during a series of years, received a large amount of cocoons. A lady of Lancaster County raised cocoons from which a piece of silk fifty yards in length was manufactured. From this a court dress was prepared for the Queen, who sent from Windsor Castle, in return, a handsome present to the fair donor on the banks of the Susquehanna.

Large mulberry groves flourished at Princeton, New Jersey, and cocoons of excellent quality were produced in encouraging quantities. But, as in the South, the convulsion of the Revolution, unusually severe in Pennsylvania and New Jersey, prostrated this branch of industry, and though efforts were made after peace to revive it, they were not specially successful.

Massachusetts and Connecticut took the lead in this enterprise in the East. It received the fostering support of the authorities. Governor Law, in seventeen hundred and forty-seven, appeared in a silk coat and stockings of home production. A few years afterward, President Stiles, of Yale College, officiated at Commencement in flowing robes of Connecticut silk. In seventeen hundred and seventy, Boston and New Haven vied with each other in raising cocoons, and in spinning, dyeing and manufacturing raw silk.

A flourishing manufactory of sewing silk was established at Mansfield, Connecticut, before the Revolution. Ipswich, Massachusetts, was at the same period noted for its silk products; while the largest and finest mulberry nursery in the country was growing at Northampton.

All these enterprises suffered by the blight which fell upon all industrial pursuits during the revolutionary war.

Silk husbandry and manufacturing had almost ceased to exist in the United States at the commencement of this century. Since then they have not kept pace with the advance in kindred pursuits.

Nevertheless, they have always been prosecuted to an encouraging extent in various parts of New England, New York, New Jersey and Pennsylvania, as, for example, Mansfield, already referred to, has done a large business in sewing silks, and produced, in eighteen hundred and thirty-nine, five tons of the raw material. Washington, Pennsylvania, always kept up the business. It was introduced into the State Prison, at Auburn, New York, in eighteen hundred and forty-one, and the first year the product of sewing silk was about thirteen thousand dollars. It was steadily increasing in the country, when, some twenty-five years ago, its growth was checked by a disastrous speculative furor in the *morus multicaulis* shrub which, for a few years, raged through the Union like an epidemic. The reaction fell heavily upon the whole business, covering it temporarily with odium and ridicule. It has since been slowly recovering from this season of delusion and folly.

In eighteen hundred and forty, the product of silk raised in the United

States was estimated at about sixty thousand pounds, valued at two hundred and fifty thousand dollars. In eighteen hundred and forty-four it had increased to four hundred thousand pounds, worth one million five hundred thousand dollars. By the census of eighteen hundred and fifty, when the effect of the speculative mania had culminated, the annual product was reported at only fourteen thousand seven hundred and sixty-three pounds. Then it began to revive, and by the census report of eighteen hundred and sixty, it appears that the manufacture of sewing silk was carried on extensively in Connecticut, New Jersey, Massachusetts, Pennsylvania and New York, the States being named in the order of the value of their products.

The annual production in those States, including tram, organzine, etc., was placed at upwards of five million dollars.

Ribbons were made to a small extent, so were also silk stuffs. But, aside from sewing silks, the chief silk manufacture consisted of ladies' dress trimmings, coach laces, etc., of which the cities of Philadelphia and New York are reported as producing about two million three hundred thousand dollars worth. Since eighteen hundred and sixty, the business, in all its departments, has made steady progress, and the current period is more favorable than any previous one for its energetic prosecution.

Our country is specially fitted for silk culture. The experiments in Georgia and South Carolina proved that their soil and climate were peculiarly suited to it. May we not hope that, after a lapse of eighty-five years, it will be renewed in those States, and be prosecuted successfully not only there, but also in all the middle latitudes of the Union, whose rich soil, genial sun and dry atmosphere are admirably adapted to cultivation and manufacture of this beautiful and useful article?

But, though the possibility of the success of this kind of industry has been demonstrated in a great number of localities in America, it is probably to the Pacific Coast that we are to look for its greatest triumph. Among the finest cocoons exhibited at the Exhibition were specimens from California. They were perfect in form and remarkable for their white, silvery hue. The soil in the valleys of California is proverbially fertile, and mulberry trees are produced of the richest and most luxuriant growth.

Its dry, warm, equable climate makes it vastly superior for silk husbandry to France or Italy. In European countries the rain and dampness destroy a much larger percentage of the grubs than on the Pacific Coast. An intelligent and enterprising French emigrant, who is enthusiastically prosecuting this industry at San José, declares that the humidity and electricity of Europe destroy from twenty-five to seventy-five per cent. of the silkworms, while under the dry, elastic skies of California few ever perish. These considerations in a measure compensate for the higher wages of American labor.

There are other savings in this industry as compared with its prosecution in Europe. In California there is no necessity for artificial heat to hatch the eggs. To transfer them from the cellar to the garret and expose them to the heating of the sun's rays is sufficient. Nor need the cultivator run the risk of the "baking" process, so liable to dim the lustre of the silk. The powerful rays of the sun for a few hours will stifle the chrysalis, render the cocoon ready for the spinner, and preserve the brilliancy of the material.

California eggs are already highly valued by foreign silk-growers Cultivators are diffusing them along the Pacific Coast. A considerable

capital is invested in the silk business. The largest cocooneries are at Santa Barbara. An important experiment is now being made there by energetic parties, who have already ten thousand mulberry trees, and have produced the present year (eighteen hundred and sixty-seven) upwards of three hundred thousand cocoons of excellent quality.

An enterprising company is erecting an extensive factory at San José, to be furnished with all necessary machinery, including some forty looms, for producing taffetas in all colors and of the best qualities.

May we not hope that the day is not far distant when the plains that *slide down* from the western base of the Sierra Nevada will become as famous for beautiful silks as its gorges have long been for precious metals and its valleys are now becoming for cereals?

The nationality of the Commission from which this report emanates must furnish the excuse for dwelling so long at the outset upon the subject of silk culture and manufacture in the United States. It will be resumed in brief terms near the close of the report. As germane to the American branch of this subject, it may be stated in this connection that silk culture was recently commenced in the Republic of Ecuador. Its soil and climate are said to be wonderfully adapted to the growth of the mulberry and the rearing of the grub, especially in the neighborhood of Quito.

The first eggs were imported from France in eighteen hundred and fifty-nine. The first exported to France was in eighteen hundred and sixty-five, where the eggs were highly esteemed, and were wholly exempt from the peculiar disease prevailing in Europe. Like its vegetation, silk culture in Ecuador can flourish the year round.

The food required by the worms is only half as much as in Europe, because of the superior richness of the leaves and the more favorable condition of the climate. The number of mulberry trees now growing in the republic is nearly a million. Labor is abundant and excessively cheap. The promoters of this enterprise in Ecuador indulge sanguine hopes of success. No doubt considerable portions of South America are well adapted to this department of industry.

REARING OF SILKWORMS.

Numerous observations made by French and Italian scientific agriculturists and silk husbandmen show:

First—That the culture of the mulberry tree and the breeding of silkworms is possible up to a limit very far advanced northwards, a limit fixed by the frequent occurrence of a temperature of seventy-seven degrees Fahrenheit.

Second—The limit of the culture of the mulberry does not pass beyond that of the cultivation of the grape, and the culture of the former is possible wherever the latter will thrive.

Third—The mulberry can be raised upon the sides of the mountains of Europe up to the point where the mean temperature of the year is forty-nine degrees Fahrenheit.

Fourth—Climates habitually stormy are not congenial to the breeding of the silkworm.

Fifth—Places afflicted with fevers (proving the existence of marshy emanations) are pernicious to the silkworm.

Sixth—This industry is to be considered rather as an adjunct to a large farm than as a chief occupation.

To these principles, given as the natural conditions necessary or hurtful to the industry of silk husbandry, are to be added the not less important question of the price at which it returns from the hand of the workman in each locality, and of the abundance and scarcity of manual labor. We must, however, remark that the insufficiency of worms and their high price during more than ten years, in consequence of the malady of the precious grub in Europe, allow a remuneration sufficiently high to cover the expenses of the dearest hand labor, especially if we consider that the duration of care and attention which the harvesting of the worms demands does not exceed six weeks, counting from the day of hatching to a period after the warehousing of the cocoons, which latter, according to the best systems in use in Italy and France, can be reeled during the whole year.

PRODUCTION OF RAW SILK.

The production of the cocoons is essentially an agricultural industry, and the winding off the cocoons into raw silk may be considered as semi-manual and in part automatic. All the other transformations of the silk, from the throwing to the making of the stuffs, are entirely mechanical.

It can hardly be possible that henceforth the United States will not take a large share in the immense industrial and commercial movement to which silk has given rise in the world.

Certain countries, such as Italy and France and the Oriental nations in general, employ themselves with all the transformations of silk, from the culture of the mulberry and the breeding of the worm, to the manufacture of tissues.

England (and others follow her example to a limited extent), although not producing silk on her own soil, yet carries on a most important commerce in that article, by means of her colonies and powerful marine. She develops with equal activity the spinning or throwing of silk thread and the weaving of silk goods.

In a word, nations such as the United States, Switzerland and Northern Germany, which are almost exclusively manufacturers, confine themselves to the transformation of silk bought in markets more or less distant.

The aptitudes of manufacturing nations change or are materially modified from time to time. Russia, for example, could, but recently, hardly be ranked among manufacturing nations. The people of that great empire are now making not only rapid progress in the industrial arts, but they have advanced in the south of Russia, on the Caucasus, even to the breeding of silkworms.*

The production of the silkworm in that country, since the annexation of trans-Caucasian Asia for example, has been three fold, though the silk is far from being worked with the requisite care—it being generally irregular and suited only to the most common productions.

In eighteen hundred and sixty-five this part of Russia exported nearly thirty thousand kilogrammes, or sixty-six thousand one hundred and fifty-five pounds,† representing a sum of about one million five hundred

* The culture of the mulberry tree, the introduction of which into Russia dates from the period of Peter the Great, remained without any great results up to the commencement of the present century.

† The metrical system being in use in most of the countries from which we have derived our information, and constantly tending to extend itself more and more, especially since the International Conference at Paris, we have thought it useful and proper to retain, in part, for the numbers cited, the franc as the unit of money and the kilogramme as the unit of weight.

and sixty thousand francs (three hundred and twelve thousand dollars) —that is to say, at the price of about fifty-two francs the kilogramme, whilst that of France and Italy sold for at least double that price.

It is thought that the total silk production of Russia amounted to about eighty-eight thousand kilogrammes, or one hundred and ninety-four thousand and fifty-four pounds, estimated at a value of about four million five hundred and seventy-six thousand francs (nine hundred and fifteen thousand two hundred dollars). This result is far short of the limit which may be ultimately attained both in regard to quantity and price.

Germany and Switzerland have the same tendency, whilst France, the different States of Italy and Spain, in consequence of the scourge which attacked the production at its source some years ago, are becoming almost entirely manufacturing countries, and benefit India and the extreme East by their increasing wants.

The United Kingdom of Great Britain alone seems to profit by fluctuations so unfavorable to the rest of Europe, and even to America.

English ships go to collect in China, in Japan, at Calcutta, Bombay and elsewhere the eggs or *graines*, cocoons, silk and the waste, to sell again. After having first directly supplied her own manufactories, the surplus is disposed of to her neighbors in Europe, she thus profiting by the transport, warehousing, commissions, brokerage, etc.

Silk forms one of the principal articles of commerce in the business transactions of England with the extreme East.

The following table will show, as near as can be ascertained, the value of raw silk produced annually in the various countries of the earth, and its vast importance as an element of national wealth:

Countries.	Value.
Asia	$141,000,000
Europe	73,480,000
Africa	220,000
Oceanica	120,000
America	80,000
Total	214,900,000
The amounts may be divided as follows, viz:	
Chinese Empire	$81,200,000
Japanese Empire	17,000,000
Persia	5,000,000
The Islands of Asia Minor	5,200,000
Syria	1,800,000
Turkistan (in China)	400,000
Turkistan (independent, in Asia)	1,400,000
Corean archipelago	100,000
France	25,600,000
Italy	39,200,000
Turkey in Europe	7,000,000
Spain and Portugal	3,200,000
Pontifical States	1,300,000

Countries.	Value.
Greece, Ionian Islands	840,000
Morocco, Algeria, Tunis, Mediterranean coast	300,000
Basin of the Danube, Austria, Bavaria, Servia, Hungary	1,280,000
India	24,000,000
America	80,000
Total	$214,900,000

These figures have been greatly reduced during the last few years, as far as concerns the production in Europe. The difference, however, was made up by the quantities received from China, India, Japan and the Levant.

But those exotic silks are far from being as highly esteemed or as valuable as those of Europe.

The modification in the relative value of silk which has taken place during a century is worthy of note.

A century ago nearly all the silk, or at least five sixths of the quantity manufactured by French fabricants, came from foreign countries, from the Levant, from Persia, Sicily, Italy and Spain.

The other sixth only was produced in the south of France. The mean price of French silk was fifteen francs the livre, or thirty francs the kilogramme (two and one fifth pounds.) Exotic silks were much dearer. The most common foreign raw silk, that of Greece, then brought one hundred and twenty francs the kilogramme; China and India silks, two hundred and forty francs; and that of Italy was valued at from five hundred to six hundred francs.* But by degrees French silk improved to such an extent that, in the early part of this century, the price advanced to seventy francs the kilogramme. This rate was maintained, almost without variation, up to the year eighteen hundred and forty; while foreign products were depreciated to such a degree that the very best quality from Levant and from Persia sold at forty francs and the waste at thirty-two francs.

Italy, during this period, maintained the elevation in its prices, on account of the very excellent quality of its silks. That was nevertheless surpassed by the French silks, which finally rose from the last to the first rank, which they still maintain.

The raw silks of France, of the first quality, at a later period brought one hundred and fifty francs, while those of the best kind from Italy realized hardly one hundred francs. These results are due entirely to the progress in French manufactures, which has largely contributed to the extraordinary development of the silk industry that has occurred in that country.

This specialty of silk industry has given to France the importance that the cotton industry has to England.

In this connection it may be profitable to give a rapid sketch (so far as data will permit) of the progressive development of silk culture and

* These are the prices as published in the price current of the Amsterdam market, where at that period the greatest quantity of foreign silk was sold.

manufacture in the principal countries of Europe and Asia. The amounts are given in round numbers, and though obtained from trustworthy sources may be liable to some corrections.

As first in importance we begin with France.

PROGRESSIVE DEVELOPMENT OF SILK INDUSTRY IN FRANCE.

In seventeen hundred and eighty-nine France produced one million pounds of raw silk. Near the close of the century she consumed one million two hundred thousand pounds of silk thread, from which she manufactured from three million dollars to four million dollars* (fifteen to twenty million francs). Of this she purchased about one million four hundred thousand dollars (seven million francs) from other countries. The stock of stuff goods consequently amounted to from four million four hundred thousand dollars to five million four hundred thousand dollars (twenty-two million francs to twenty-seven million francs), of which France exported about one half to foreign countries.

In eighteen hundred and twelve France produced six hundred thousand pounds of raw silk and three hundred and forty thousand pounds of organzine, valued at five million dollars. The same year she imported nine hundred thousand pounds, valued at six million seven hundred and fifty thousand dollars.

In eighteen hundred and twenty it is estimated that French manufacturers transformed ten million dollars (fifty million francs) of materials, of which one half was furnished by the southern Departments. The goods produced from these materials represented a value of more than twenty million dollars (one hundred million francs), of which fourteen million dollars (seventy million francs) were consumed at home, and six million dollars (thirty million francs) were exported.

In eighteen hundred and twelve the silk looms in seven of the principal towns of the Empire numbered twenty-seven thousand. In eighteen hundred and twenty-four Lyons alone had nearly twenty-five thousand. In eighteen hundred and thirty-nine the number in Lyons had increased to forty thousand, and in the whole kingdom to eighty-five thousand, employing about one hundred and seventy thousand workmen. In the latter year the entire production was estimated at forty-six million three hundred thousand dollars.

In eighteen hundred and fifty the business had largely increased. The value of raw silk grown in the kingdom was twenty-eight million dollars (one hundred and forty million francs); the capital employed, fifty million dollars (two hundred and fifty million francs), the amount imported being twenty-two million dollars.

The silk goods sold were valued at seventy-five million dollars (three hundred and seventy-five million francs), of which about one third were consumed at home and two-thirds exported.

In eighteen hundred and fifty-five the value of silk goods produced was estimated at one hundred and six million five hundred thousand dollars, of which about twenty-six million five hundred thousand dollars was imported. The home consumption was thirty-five million dollars and the export about seventy-one million five hundred thousand dollars. The number of silk looms in the Empire was about two hundred and twenty-five thousand. The number of persons engaged in this industry was upwards of half a million.

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* Dollars at gold valuation in all cases.

In eighteen hundred and sixty the value of French goods amounted to upwards of one hundred and forty million dollars (seven hundred million francs), and yet this was not sufficient to supply the demand. France purchased in foreign countries forty million dollars (two hundred million francs), chiefly of piece goods, velvets and ribbons. Of this one hundred and eighty million dollars, France exported about one hundred and ten million dollars (five hundred and fifty million francs.)

These totals were reduced at the outbreak of the American rebellion. France restricted to a marked degree her purchases of silks. The United States purchased from France, of silk tissues alone, in eighteen hundred and fifty-nine, twenty seven million six hundred thousand dollars (one hundred and thirty-eight million francs); in eighteen hundred and sixty, twenty million eight hundred thousand dollars (one hundred and four million francs); but in eighteen hundred and sixty-one only five million dollars (twenty-five million francs).

Subsequently the business increased, the Lyons export of silks to the United States in eighteen hundred and sixty-five amounting to nine million nine hundred thousand dollars, and in eighteen hundred and sixty-six to six million dollars.

Though the rebellion has been suppressed, the fiscal measures resulting therefrom still have their effect upon the silk husbandry and manufacture of France, operating as they do at the same period with the scarcity of indigenous silk, and the prevalence of the mysterious disease among the silkworms, which has by no means disappeared, and to which special reference will be hereafter made.

RISE AND PROGRESS OF SILK INDUSTRY IN GREAT BRITAIN.

When the Duke of Parma sacked the City of Antwerp, in fifteen hundred and eighty-five, its silk artificers fled to England, carrying with them their experience and skill in this noble branch of industry. It was encouraged by the English Government, but the humid climate being unfavorable to the rearing of the grub, it was not specially successful.

On the revocation of the edict of Nantes, in sixteen hundred and eighty-five, some seventy-five thousand of the most skilful artisans of France took refuge in Great Britain, among whom were a large body of silk weavers, who settled in Spitalfields (then a London suburb), and under the fostering care of the Crown they and their children plied their vocation with success for a century and more, some of their descendants remaining in the same locality to this day.

For thirty or forty years after immigration England was wholly dependent on foreigners for organzine silk thread, but in seventeen hundred and eighteen Mr. Lombe, an English capitalist, visted Piedmont disguised as a common laborer, took sketches of silk-throwing machinery in use there, and on his return erected an extensive mill at Derby, which produced more than three million yards of organzine per day.

For many years raw silk was largely imported. Acts of Parliament were passed from time to time stimulating its manufacture, and the business was steadily advancing, when, in seventeen hundred and sixty-four, on account of low wages, scarcity of work and the preference shown for French silks, the weavers of Spitalfields and the silk operatives of other localities assembled, in tumultuous manner, and petitioned Parliament for the total prohibition of foreign-wrought silks.

The commotion was kept alive by combinations of operatives for several years, till, in seventeen hundred and seventy-two, it broke into open riots, which convulsed London many days, the final result being the passage of prohibition laws, which after trial proved unsatisfactory.

This system of prohibitory legislation continued till eighteen hundred and twenty-four. A high English authority has declared that "the manufacturer, depending upon the protection of Parliamentary restrictions on foreign competition rather than on his own skill and exertions, was not anxious to discover and introduce improvements into the manufacture." And he states that "since the change of system the imports of the raw material and the exports of the manufactured article have rapidly increased." In eighteen hundred and twenty-five the English silk looms numbered about twenty-four thousand; in eighteen hundred and fifty-five they had increased to more than one hundred and ten thousand, consuming about five million five hundred thousand pounds of thrown silk, and producing goods to the value of near forty-five million dollars, besides a considerable amount of spun silk and goods of which silk constituted a part.

In eighteen hundred and fifty-five England consumed of her own silk manufactures more than thirty-five million dollars, while she imported about twenty million dollars. In eighteen hundred and sixty the value of her silk manufactures was estimated at some ninety million dollars. On account of the extreme dampness and chilliness of her climate (of which mention has been made) she raises no silkworms, but imports the raw material.

In eighteen hundred and fifty-six the value of her imports of raw silk was (omitting fractions) thirty-two million dollars, and in eighteen hundred and sixty-seven, fifty-eight million dollars. It fell off in eighteen hundred and fifty-eight, on account of the "panic," but again revived. Nearly one-half the amount of the raw material came from China, and a large share of the balance from her East India possessions.

During the three years just mentioned England imported one million three hundred thousand dollars of thrown silk, more than one half being from France and nearly one third from China.

The consumption of raw and thrown silk from eighteen hundred and sixty to eighteen hundred and sixty-seven was as follows:

Years.	Pounds.
1860	9,420,417
1861	8,125,982
1862	9,706,202
1863	8,182,645
1864	7,541,578
1865	6,492,720
1866	5,273,767

The export of silk goods by Great Britain was as follows:

Year.	Amount.
1823	$ 702,000
1844	3,682,000
1856	14,800,000
1858	11,950,000
1861	11,560,900
1865	10,886,000

Thus we see that this great manufacturing nation, notwithstanding by its uncongenial climate deprived of the capacity to successfully produce the raw material, has long prosecuted a large business in the transformation of this beautiful article, though now seriously checked in many branches of its silk industry by the effect of the recent treaty with France.

What an instructive lesson is thus taught to the citizens of our country, where everything combines to render the prosecution of this industry pre-eminently successful.

OTHER EUROPEAN COUNTRIES.

Italy was early famous for its silk culture and manufactures. In Milan and vicinity, in the year eighteen hundred, about two million pounds of raw silk were said to have been collected. In eighteen hundred and twenty-five the quantity was estimated at two million seven hundred thousand pounds, valued at ten million dollars; in eighteen hundred and fifty-eight, at five million four hundred thousand pounds, worth thirty million dollars. In eighteen hundred and twenty-five, Piedmont produced about one million five hundred thousand pounds of raw silk of the very highest quality. In the same year Tuscany, Naples, the Romagna and Calabria produced one million five hundred thousand pounds, also excellent in quality. In eighteen hundred and fifty-one an Austrian official document stated the productions in the Austrian dominions of Italy at twenty-one million seven hundred thousand dollars in raw silk, and fourteen million two hundred thousand dollars in manufactured silks. In eighteen hundred and fifty-five the total of both kinds of silk in the whole Italian peninsula was stated at upwards of sixty million dollars. A considerable portion is consumed at home, and the remainder exported, chiefly to Germany, France and England.

Spain produced in eighteen hundred and forty-two about two million pounds of raw silk, three fifths of which was raised in Valencia. About four hundred thousand pounds were manufactured at home and the rest exported. The Spanish cocoons are excellent, but much of the reeling is defective. Valencia silks, where great care has been taken in the manipulation, are famous for their magnificence.

In Prussia, silk manufacture is rapidly increasing. The number of looms in eighteen hundred and thirty-one was nine thousand; in eighteen hundred and thirty-seven, fourteen thousand; in eighteen hundred and fifty-five, twenty-five thousand; and in eighteen hundred and sixty-five not less than forty thousand. In the Exhibition were superb silks, velvets, velvet ribbons, black silk ribbons, mixed and unmixed silk fab-

ries of various descriptions, from Crefeld, Elberfeld, Viersen and vicinity. The waters in that locality, especially those of the Wipper, hold in solution salts specially adapted to secure permanency and brilliancy to the colors employed in manufacture.

Austria is engaged somewhat extensively in silk manufacture, but since she relinquished her Italian dominions this industry has doubtless received a check.

The product of Switzerland in eighteen hundred and fifty-eight was placed at twenty million dollars. The "Collective Exhibition of the Zurich Manufacturers" of black and colored silks, plain and colored, and the "Collective Exhibition of the Basle Silk Ribbon Manufacturers," as shown in the Exposition, evince the progress and perfection to which Swiss skill in silk industry has now attained.

Russia has already been alluded to. After France and England, the nations that come in the order of their importance in respect to silk manfactures are: Switzerland, Prussia, Austria, Italy and Spain. France maintains a great superiority over all in her rich and artistic productions; but in plain goods and those of a secondary quality she finds serious rivalry in British, Swiss and German industry. Switzerland is becoming remarkable for her activity, her constant progress and her improvements in material interests.

In a subsequent part of this report the occasion will be embraced to examine the improvements she brought to the Exposition, since there is a great analogy between the situation and industrial genius of that republic and the social and manufacturing condition of the United States.

ASIATIC COUNTRIES AND AFRICA.

China raises, manufactures, consumes and exports a vast amount of silk. It is impossible to estimate the quantity consumed at home. A high authority declares that, of her four hundred millions of people, a large proportion, excepting the lowest classes, are clad more or less in silk fabrics. She exported to England alone in eighteen hundred and fifty-eight, nearly ten million pounds. In the East India Company's possessions the product is large. In eighteen hundred and fifty-seven they exported to England about four million five hundred thousand pounds. Persia produced great quantities, much of which is consumed at home. The amount raised in Syria and Asia Minor is some two million five hundred thousand pounds per annum, of which a large share is exported to France and England. Reference to other Asiatic countries of inferior importance in this particular is omitted.

Silk has long been produced in small quantities along the African shores of the Mediterranean. England imports some of the raw material from Egypt, but the greatest share of the productions of the Nile region is consumed at home. Tripoli produced in eighteen hundred and forty-two about one hundred and thirty thousand pounds. The Islands of Cyprus and Crete raised in eighteen hundred and fifty-six some fifty thousand pounds.

SPECIALTIES EMBRACED BY SILK INDUSTRY IN THE EXPOSITION AND IN PRACTICE.

The labor in silk comprises seven distinct branches, forming as many different industries, even when a single manufacturer conducts several in one establishment. These specialties are:

First—The breeding or rearing of silk worms, called in France the art of the *magnanier* (or silkworm breeder). This word comes from *magnan*, the name given to the grub of the white mulberry in the south of France.

The appellation *magnanerie* (or silkworm nursery), is given to the locality where the worms are hatched, fed and attended to from their birth till they have formed their silky envelop or cocoon.

These silkworm nurseries are generally established in localities or countries favorable to the cultivation of the mulberry tree, of whose leaves, and white fruit especially, the worm is particularly fond; and also where the temperature is regular and moderate. Nevertheless, this last condition is not indispensable. It is replaced artificially by special means of warming and ventilating so as to maintain at will, constantly, the temperature between seventy and seventy-five degrees Fahrenheit and thus be able to breed numerous little grubs (one ounce or thirty grammes contains about forty thousand, while from twenty ounces eight hundred thousand have been obtained at a time in the same place). This result is arrived at chiefly by watchfulness in ventilation, in removing the vitiated air and replacing it by pure air.

The art of the silkworm breeder embraces what is called "the fabrication of the *graine*," or, more correctly, of the eggs to be used in the reproduction. The cocoons destined for this function are the only ones whose chrysalis or grub is allowed to be transformed into the butterfly. These are moistened and then the grub opens one of the lengthened extremities of the cocoon and issues from it.

Then the grubs are collected by pairs, male and female, to permit fecundation before the laying of the eggs. These *fecondés*, suspended on paper or cloth, are subsequently put aside until the following Spring, in an atmosphere of even temperature and sufficiently low, like that of cellars.

This part of the art of the breeder, so simple in appearance, demands special knowledge and great care, particularly at this time when it is so difficult to procure eggs free from the epidemic now raging among the silk worms.

Second—The second specialty in this industry is the *filature*, or reeling of the silk from the cocoons into the threads known as raw silk, and composed of fibres of a certain number of cocoons according to the size of the thread required. It is a most delicate untwisted product, but wanting in lustre on account of its containing some twenty-five per cent. of gum.

Third—The throwing of silk, or the process of putting the raw silk into the threads required for the different kinds of weaving.

It is at the throwing that the threads are formed that figure so conspicuously at the Exposition, and also in commerce, under the names of simples, trams and organzines. There are also other kinds of thrown silk, known as marabouts, grenadines, crépe, soie ondée, etc., which are twisted differently from trams and organzines, for special purposes.

Let us look for a moment at the comparative value of each of these denominations. The singles are the raw silk after the first twist. The tram, or woof is obtained by the union of two or more threads of raw silk, slightly twisted. The organzine, from which in general is made the warp, is the result of two singles twisted together.

A product of peculiar nature, frequently used in the manufacture of trimmings, is the *fil guipé*. It is composed of one or more straight threads, around which is rolled a spiral thread, the interior being gen

erally of indifferent material, and the thread rolled around is composed of silk, gold, or silver.

Fourth—The dyeing constitutes an important specialty, requiring the greatest possible delicacy and skill, pure water being essential to success.

Fifth—The preparation of the threads for the loom is another separate and essential branch, requiring care and attention.

Sixth—The weaving embraces in itself alone several subdivisions, viz: The weaving of plain and cut silk goods; the weaving of velvets of figured stuffs more or less rich; the knitting of various articles and the fabrication of silk blondes or laces.

THE SPINNING OF WASTE SILK.

Seventh—The preceding processes yield a certain quantity of waste, varying with the nature of the operations and the qualities of the products.

This waste is in its turn transformed from the raw state, where, after having been cleaned from the gummy matter, chiefly by mechanical means, it presents a close analogy to the strippings and windings of cotton and combed wool.

These processes are the basis of great industries which flourish in England and on the continent.

The threads thus produced vary in value from thirty to sixty francs the kilo, according to their fineness and quality.

These branches of industry are now carried on to some extent by American manufacturers.

EXAMINATION OF THE POSITION OF EACH OF THESE INDUSTRIES, AND THEIR PROGRESS AS MANIFESTED IN THE EXPOSITION.

In the art of silkworm breeding the question of first importance consists in the means of obtaining the *graines*, or eggs. Good eggs bear an exorbitant price. They are worth at the rate of three hundred francs the kilo, and still they cannot always be produced guaranteed against the prevailing malady, except from Japan.

The States of South America appear to enjoy the same immunity. At the commencement of the prevailing epidemic (about the year eighteen hundred and forty-six), other countries furnished healthy eggs, but their exemption did not continue after the second or third generation. Thus it is that the United States have been led to put all silk-producing countries under contribution.

Will the eggs of Japan and of South America, at the present time so much sought after, escape this degeneracy, of which, despite the numerous investigations, we as yet do not know the cause?

But if the cause remains concealed, the preventive means begin to be more clearly established.

The following method is generally admitted and recommended by men recognized as the most competent judges; and since it is the combined result of great experience and observation, it will be read with interest in all countries which desire to encourage the culture of the silkworm:

First—It is of great importance to choose for reproduction cocoons of the largest size, and those the most successfully reared and least affected with the malady during the course of their development. These cocoons are recognized by the regularity of their form, the roundness of their

extremities, the fineness of grain on the surface, and the solidity and thickness of the layers or silky envelopes.

The male cocoons differ from the female by their shape and size. The former are smaller than the latter, and present a cavity upon their back. The latter are larger, presenting the figure of an olive, or the egg of a small bird.

The color of these cocoons ought to be of a golden yellow after collecting, and should exhibit no spot or stain of any kind.

In the same breed, the heaviest cocoons are in general those which offer the greatest chance of affording the best reproductions. Then, after having put a certain number of male cocoons on one side and of female on the other, weigh both parts to find the average weight of each, and every time that this average weight is exceeded there is a presumption that excellent cocoons are obtained for reproduction, all other things being equal.

It is, however, necessary to remark that, as one part of the cocoons contains sometimes the same gross measurement, it should not be confounded with the normal cocoons. Cocoons of an exceptional bulk are in general the result of two grubs united under the same envelope. Their product is known under the name of "doubles," or "douppions," or twin threads.

This sort of product is always inferior, as much because the beds or envelopes are almost indivisible, as because the association in the work indicates a weakness in the subject.

Notwithstanding all the attention and care given by the breeder to prevent the production of doubles, and sometimes even of triples, he must inevitably expect to find a certain proportion of those, the value of which is hardly one third the price of the normal product.

There was exhibited in the Exposition an apparatus contrived by an Italian silk husbandman, designed to prevent these *douppions* in the breeding of worms.

The apparatus consists in an arrangement of cells made of very light wood, each one of which has only the bulk necessary for a single grub. When these come to their full development, ready to spin their cocoon or boll, instead of preparing heath, shrubs, or other kinds of shelter or supports against which the worms are to spin, this kind of cells is supplied where each insect has its own separate case, which prevents two or any greater number from uniting to make a defective product.

The Italian exhibitor is endeavoring to bring into general use this system of isolation or cellular breeding.

The system presents, according to the inventor, other advantages, by the facility which it offers in the choice of the best reproducers, and by preventing the coupling between grubs of the same family, consanguinity having been considered as one cause of the rapid deterioration of the breed.

When the coupling has been accomplished, the females are removed and made to lay, each in the cell reserved for her, in such a way as to be able to weigh separately the eggs of each laying.

This weight is not to be inferior to a certain ascertained proportion, for the eggs would then be evidently bad. In order that they may offer good chances of success, each laying should weigh at least sixty or seventy grammes (per kilo of cocoons), each gramme to contain one thousand three hundred and fifty to one thousand five hundred eggs on an average.

THE COMMON SILKWORM (*Bombyx Mori*).

The common silkworm and the species mostly in use, and which produces by far the best silk, is born in the Spring, ordinarily about the middle of May. It feeds on the leaves of the mulberry tree and attains its full growth in about six weeks.

During that period it changes its skin four times, and according to M. de Quatrefages, of the French Institute, increases its weight seventy-two thousand times. Early in July, having reached its full development, it establishes the workshop of its wonderful manufacture.

Placed in a comfortable and secure position, it proceeds to envelop itself in a cocoon formed by a filament of exceedingly fine silk, emitted from the stomach of the insect. It soon disappears in the centre of the cocoon or silken envelop, and, after about seventy-two hours of unremitting labor, produces a thread ordinarily not less than sixteen hundred yards in length.

In that chosen retreat the silkworm again sheds its skin, for the fifth time, but the insect which comes out is no longer a silkworm, but a chrysalis—bearing but slight resemblance to the worm. After two weeks or more, according to the temperature, the skin of the chrysalis opens, and, changing for the last time, it becomes a butterfly, lays some hundreds of eggs, and dies.

Besides the *Bombyx Mori*, there are other species of silkworms that merit a brief notice, and particularly the following:

CASTOR OIL PLANT SILKWORM (*Bombyx Arrindia*).

This species of silkworm is a native of Bengal and of British India. It lives, both in its wild and in its domesticated condition, upon common castor oil plants and other vegetation. It was but recently introduced into Europe by means of a few living cocoons imported into Malta. Their propagation was not only successful, but was continued in Italy, whence many were sent to France and to the Canary Islands.

Wherever the castor oil plant grows spontaneously, as in Algiers, Brazil and Rio de la Plata, the efforts to raise this species of silkworm have been crowned with success. Its cocoons cannot be reeled in the ordinary way, but they furnish a staple which, when spun into threads, produces fabrics of great suppleness and durability, though almost destitute of lustre.

AILANTHUS SILKWORM (*Bombyx Cynthia Vera*).

This kind of worm is indigenous to the temperate regions of China, where it lives mainly on the ailanthus. It has long been cultivated by the Chinese in the open air, and produces an elongated cocoon of a reddish shade, furnishing a kind of *bourre de soie*, from which is made a very strong and durable tissue.

This silkworm was introduced into Europe for the first time in eighteen hundred and fifty-seven, and into France in eighteen hundred and fifty-eight, where the first successful rearing of it is chiefly due to Madame Drouyn de Lhuys.

But it is to M. Guerin Ménéville, who, under the patronage of the Emperor, experimented extensively and with success, that belongs the credit of having given to this silk its growing importance and industrial value.

THE TUSSEH SILKWORM (*Bombyx Milita*).

This notable insect lives in a wild state in Bengal and in the hot regions of India, in the woods, where the inhabitants go to gather the cocoons, which are remarkable for their size and form. Its favorite food is the leaves of the jujube tree. Efforts have been made repeatedly to reproduce it in France, but in vain. The cocoons of this insect produce a fine and brilliant silk and very strong, and known in India as *Tusseh*, of which large quantities are exported to Europe.

THE WILD SILKWORM OF JAPAN (*Bombyx Yama May*).

This worm, raised from eggs sent from Japan by the Consul-General of France at Yedo, has been successfully reared. The oak leaf and trees of the same kind are its only nourishment. It does not require great heat and is easy to raise. Its cocoon, of a greenish yellow, is formed like that of the ordinary silkworm and can be reeled into a beautiful silk.

BOMBYX CECROPIA.

This description of worms, indigenous to the temperate regions of North America, is found principally in the Carolinas, Louisiana and Virginia.

In its uncultivated state it lives upon the elm, the willow and other trees. It produces a large cocoon of a loose texture and coarse silk.

At the Exposition there was a collection of silkworms in their different stages. A quantity of eggs, of mulberry leaves, of all that relates to the rearing of the silkworm were also displayed there.

The silkworm is tender and delicate. The experiences of the last twenty years have proven that it is liable to epidemics, that rage with peculiar violence and fatality.

STATE OF THE SILKWORM MALADY AND THE REMEDIES PROPOSED.

During the period in which the disease in question has attacked the silkworms, great research and the most minute study have been made to ascertain the cause.

Some have ascribed this calamity to the mulberry; others have compared it to a species of Asiatic cholera, or an epidemic analogous to the cattle distemper from which England and Germany have suffered so much within the last few years.

Others have asserted that the breeder had gradually departed from and neglected those healthful traditions and maxims so essential to be observed in the breeding and rearing of such delicate creatures.

The breeder, perceiving that he could abridge the period of rearing by raising the temperature of the nursery, prematurely matured unhealthy broods, and thence there arose numerous accidents, because, by raising the temperature the appetite was forced, which caused derangements in the animal economy.

These different causes, more or less vague and indeterminate, may have contributed to the development of the epidemic. However, the theory of disease in the mulberry is hardly admissible, considering that it has been demonstrated that worms of different breeds or races, nourished by the leaves of the same tree, have experienced different fates.

Some succeeded, the others were attacked by the disease and perished; therefore the food in these cases was innocent of the effect.

In the difficulties by which we find ourselves involved in endeavoring to determine the cause of the malady, we have only to seek out the character and seat of the evil, to be able *a priori* to reject infected subjects.

After numerous investigations by eminent men, certain spots or bodies of peculiar form and appearance were discovered, with the aid of the microscope, in the very tissues of the diseased worms at the bottom of their digestive canal, evidently foreign to their organization, and in quantities proportionate to the violence of the disease. To these little spots or bodies the name of "*corpuscules*" was given. They are oval, transparent, smaller than the globules of the human blood, and resemble the globules of certain fermentations.

Widely different theories prevail in regard to these "*corpuscules*" and the remedies required for their eradication. The distinguished savant, M. Pasteur, has come to the conclusion that it is an organic affection of the insect, to destroy which, either a specific remedy must be found, or else all the conditions favorable to the production of the "*corpuscules*" must be avoided, either by obtaining eggs from countries exempt from the malady, or by allowing none but healthy insects to propagate. He has demonstrated that contact between healthy and infected worms does not impart the disease; while, on the other hand, the absorption of a few "*corpuscules*" by feeding upon leaves washed with corpusculous water causes the epidemic to spread with incredible rapidity.

M. Pasteur is of the opinion that search must be made for the *corpuscules* in the chrysalis, and he develops a very ingenious method for facilitating the discovery.

He recommends the immediate destruction of all insects known to be infected, and the separation from them of the healthy ones, and enjoins the utmost cleanliness as an essential condition for the extirpation of the disease in a silk nursery.

M. Bichamp, who has devoted great patience to the investigation, propounds the theory that the disease is parasitic, and that the parasite is of a vegetable nature of the order of fermentations, and that remedies like creosote will arrest if not destroy the development of these vegetable *corpuscules*.

His mode of application is to wash the eggs in a solution of creosote, or diffuse an impregnating vapor through the rooms of the silk-worm nursery. Suffice it to say, that the methods recommended by each of these gentlemen for the extermination of the disease have been tried, but with only partial success; but all concur in the opinion that the eggs of diseased subjects are unfit for use, and should be rejected.

It has been demonstrated also that the grubs, the chrysalides and the moths proceeding from the Japanese race or that of the South American States, have been to the present moment free from all trace of *corpuscules* and all symptoms of the disease.

Practical breeders of the south of France have made very interesting experiments, from which it resulted that the worm when hatched and bred in stables or in sheep folds generally did well.

Comparative experiments prove that the same lot of eggs divided into two parts gave products good in quality and quantity as to the half raised in the atmosphere of a stable, while the grubs of the other part bred under the ordinary conditions generally perished.

These repeated trials appear to demonstrate that the grave nature of

the affliction can be modified by the alkalinity of the atmosphere which developes itself in so declared a manner under the conditions of which we have just spoken. It is a species of treatment analogous to that of the water and salt of Vichy and other thermal springs.

ELEMENTS AND EXPENSE WHICH ARISE FROM THE BREEDING OF SILKWORMS.

The industry whose object is the production of cocoons is composed of elements so special and so different from those of manufactures in general as to require that some details be given on the subject, partly agricultural and partly manufacturing.

The basis of the labor of the silkworm breeder is founded in general on the amount of mulberry leaves consumed. These leaves constitute in this case the raw material.

We will give some figures derived from localities where the population is relatively condensed, such as the south of France and the north of Italy, the principal European centres for rearing the silkworm and the mulberry.

A hectare (or 2.471 acres) of land planted with two thousand five hundred mulberry trees, produces annually an average of five thousand kilogrammes of leaves. The expenses of all kinds for the culture of this quantity may amount to three hundred and fifty francs a year. Then the one thousand kilogrammes of leaves amounts to seventy francs. The one thousand kilogrammes of leaves support a variable quantity of cocoons. In normal years it may amount to sixty kilogrammes.

Taking the one thousand kilogrammes of leaves as the unit, the average expenses for feeding worms for thirty grammes of eggs are as follows:

Expenses.	Value.
Thirty grammes of eggs, with a price very variable, are at the maximum, 15 francs	$ 3
One thousand kilogrammes of leaves, 70 francs	14
Manual labor of two persons during forty days, 160 francs	32
Warming and lighting, 10 francs	2
Cells for cocoons and incidental expenses, 5 francs	1
Total (260 francs)	$52

The fresh cocoons are now worth at least eight francs the kilogramme. It would be sufficient to obtain thirty-two kilogrammes for every one thousand kilogrammes of leaves to pay the disbursements, and if the gatherings yield, as is usual in normal conditions, fifty kilogrammes only, this would be a gain of fifty times eight, or four hundred francs (eighty dollars), and if one worked on a basis of one hectare of land only, this would be a gain of four hundred times five, or two thousand francs (four hundred dollars) in six weeks. There were breeders in

France who, before the epidemic, produced as many as one thousand kilogrammes of cocoons in a single season.

TOOLS OR STOCK NECESSARY TO TRANSFORM THE COCOONS INTO RAW SILK.

France and Italy are the only countries which have exhibited the apparatus necessary to transform the cocoons into threads of silk. These are the most advanced in the whole of Europe in this specialty.

The industry of Spain, of Greece, of the Levant and of Russia has imitated as much as possible the means used in France and Italy. Those countries have not, however, been able to arrive at the perfection of their neighbors As to the Orientals, they lose a part of the advantages which their privileged climate gives them in regard to the production of silk by insufficiency of care and skill in details.

The implements, properly so called, for converting the cocoons, are most simple in all countries of the world. They consist principally of a basin and a reel. The basin is used to receive the cocoons and some warm water to soften the gum of the silken envelope, so as to set free the threads forming the exterior silky layers. The union of a certain number of these threads forms the thread of commerce, known by the name of *grège*, or raw silk.

The reel, by its rotary motion, winds off the cocoons. In the factories, certain numbers of these winding machines are placed side by side, the impulsion being given to them by a single motive power. Of course the arrangement is such that the operator can at will stop any one of these little contrivances while the others continue to work. The entirety of the operation is automatic, except that in regard to each reel we find a basin and a woman to superintend the work. The labors of the superintendent consist:

First—In the immersion of the cocoons in the warm water until the silky layers are sufficiently softened.

Second—In the cleansing, with a species of brush or broom, of the first layers until they become a pure and clean thread.

Third—In the uniting by pressure and twisting a certain number of threads of the cocoons in proportion to the standard of raw silk intended to be produced.

The *grège* thus formed by the union of a greater or less number of cocoons is passed through an orifice or drawing frame, which acts on the winder, whose rotation determines the development of the threads of the cocoons which remain immersed on the surface of the water in the basin, so that in proportion as the cocoons are wound off the attendant is careful to add a new one, as much to keep up the supply of thread as to maintain the regularity of the standard.

The cocoons being conical from the commencement to the end of the winding, the "*grège*" would have the greatest irregularities if the workman did not conduct his work so as to connect the strongest—that is to say, the commencement of the thread of the new cocoon, with those which are just being exhausted.

The threads, issuing wet and gummy from the basin, would adhere and stick together in the skein if careful means were not taken to prevent it. The preventive consists first in preserving a sufficient distance between the basin and the reel, to permit a partial drying; and second, in a "guide thread" so arranged that the transport takes place by a

slow zigzag movement, which prevents the threads from crossing each other at the same point at each turn, which latter causes the adhesion.

Some suggestions will assist us to understand and to obviate the difficulties in this branch of the work.

The degree of previous preparation should vary with the durability of the silky couches, having regard to the age, breed and origin of the cocoons.

If prepared too much, the result would be that more silky matter would be yielded by the first layers than there should be. This superfluous matter would be only waste, and would possess a value much inferior to that of fine silk.

If the cocoons are, on the contrary, insufficiently prepared, they present a resistance to the winding off, which causes the breaking of the thread, and leads to a new source of waste. The workman ought to possess great skill in joining a new thread to a thread in work. He should be competent to select the most opportune moment to assure the regularity of the product, so that the trace of the successive connections may be imperceptible to the eye, and thus avoid knots, coarseness, curls or dots.

Nor will rare skill in these particulars produce the effect desired unless the wheel revolves with a fixed and steady velocity of at least five hundred metres per minute. Without this the thread, instead of being smooth and brilliant, would be rough and dull.

A too slow movement would not dress the thread sufficiently, clasped, as it is, very tightly by its peculiar position and fixed under the form of the figure eight in the layers of the cocoons. A movement too slow causes those undulations which give the dull appearance, while the development of the thread in the straight line by the more rapid movement permits the reflection of the light in those perfect and determined conditions which give brilliancy to the finest silk.

We have entered somewhat at length into these details because they will assist us to discover the many difficult sides of a question of apparent simplicity, and will enable us the better to understand why the more perfect development of this industry remains concentrated in the hands of some populations, and why automatic labor has not been able, till now, to bring about those elaborate and exquisite modifications in silk which have been produced in other textile fabrics. But if converting the cocoons into raw silk in a successful manner be due to local circumstances, such is not the case with the industrial specialties which follow it, commencing with the throwing or spinning of the silk.

Almost all European nations were represented at the Exposition by the different mechanisms employed in the silk manufacture. Let us take a glance at the machines of this character. We will first speak of the machinery used to sort and dress silk badly reeled, and it may be well to enter into some details on this subject, as it is one that particularly interests the American manufacturers.

Silk of the first quality being actually as dear as silver,* ought to be employed only in the best and most perfect conditions, especially when it is intended to produce fabrics like those so much admired at the Exposition, and among others the truly artistic silks of Lyons. Different

* In spite of the high price and the crisis in silk husbandry, silk costs much less than in the time of the Romans. The Emperor Aurelian refused a silk dress for his wife, assigning as a reason that it was too expensive a luxury even for a Roman Empress, silk then being sold for its weight in gold, pound for pound.

means have been devised to determine the standard of the silk thread. If it be pure, it will have the degree of solidity and tenacity desired. The manufacturer is particularly ingenious in constructing apparatus to rectify, sort and dress silks of irregular standards.

APPARATUS TO SORT, TO PROVE AND TO TEST THE QUALITIES AND PROPERTIES OF SILK.

Silk thread has more need to be sorted or numbered than the thread of other substances; the sorting or numbering is to determine the relation of the unity of weight to the unity of length. For silk, the unity of weight is generally the denier or fraction of the ancient livre of Montpellier, and the denier is equivalent to fifty-three one hundredths of a cent.

The unit of length is four hundred aunes, representing four hundred and seventy-five metres, or five hundred and fifteen yards. Thus, when we say a silk of eight ninths deniers, we mean that a thread of it of four hundred and seventy-five metres of length weighs from eight to nine deniers.*

Efforts are being made to modify this standard and to substitute the unit of five hundred metres for the four hundred and seventy-five metres, and the milligramme for the denier, in order to make the system conform to the metrical system.

The rectification of the standard of silk seems to be more necessary than that of other valuable materials, because, from the manner silk is produced, we are far less sure to arrive at regularity than by the automatic process practiced for the conversion of cotton, wool, etc.

Besides, as silk, from its nature and price, is intended for the dearest kind of products, the material employed in its manufacture ought to be so much the more perfect. The mode of titrage generally used in all periods consists in winding off a certain length, and the determination of the weight of this length. The less it weighs the finer, of course, the silk will be.

It is considered, for example, that if five hundred metres weigh one milligramme, it will be one half more fine than if it weighed two milligrammes, supposing always that its hygrometric and thermometric condition does not change during the operations. The same unit of length will weigh more if it contains humidity than if it be perfectly dry.

The public establishments of Europe to ascertain the condition of silk have for their specific object to determine, in an exact manner, the real state of the silk, its degree of humidity, and the absolute weight of this same foreign matter, as if the silk were perfectly dry.

Establishments of this kind, it is well known, exist in the principal manufacturing centres of the trade in silk and wool. They generally operate under the direction of the various Chambers of Commerce.

These means of control offer a great security to business, but unhappily they can do nothing to verify or establish the regularity of the threads.

The titrage gives, in effect, only the relation between the weight and the length, but indicates nothing as to the homogeneity of the thread. Each determinate length of a skein may have identical weight without the thread being regular. For example, if a skein of ten thousand

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* Condition publique des soies et des laines, bureau de titrage. Décret du 2 Mai, 1853.

metres presents an equal titre or standard for each one thousand metres, that would not demonstrate that upon this length there may not be parts alternately coarse and fine. This effect happens much more frequently with the silks that are poorly worked, on account of their low relative price.

Some sellers in China, Japan and the Levant strive, with great persistency, to ascertain and rectify these irregularities of thread by the windings off. During this process, when the eye discovers the defects, they are removed by the hand; but this is a slow, expensive operation, and anything but sure.

The Swiss exhibition contained an automatic apparatus which arrives much more efficient and economically at the result sought for.

THE SILK SORTING APPARATUS OF G. HONNEGER, SWITZERLAND.

This machine receives on the one part a series of skeins of silk. To each skein correspond a number of bobbins or reels, equal to that of the varied bulk supposed to be contained in the skein.

The solution of the problem consists in collecting on each bobbin thread of the same fineness. Let us suppose five bobbins from number one to number five. Each will receive the portion of the thread of the *titre* for which it shall have been designated. For this purpose the thread which is rendered from the skein to the bobbins is guided automatically by a mechanism for gauging, extremely sensitive, and so arranged that the *grège* or raw silk in passing acts upon a lever which directs the silk upon the proper bobbin.

The variation in the bulk of the product is the point of departure in the variation of the guide lever, which directs the thread to the reel proper to receive it.

A glance at the working of this apparatus enables us to understand it better than would the most elaborate description.

By the employment of this machine, the cheap silk of the East can hereafter find still more extensive applications and contribute to a new development in silk industry.

AN APPARATUS TO TRY THREADS, BY PROFESSOR ALCAN.

Another apparatus of great utility was exhibited by Professor Alcan in the French section. It is an instrument of rare precision, very simple, not expensive and works with great facility. Its object is to test the tenacity and elasticity of filaments and threads, and to determine the degree of tension most suitable to be employed on any given thread.

The mechanism of this instrument, though not at all complicated, has been explained in detail, with its applications, by the inventor, in several works very popular in France, particularly in his treatise upon the textile arts, one of which is entitled "On Cotton Labor," and the other "On the Manufacture of Wool."

These works of M. Michel Alcan, Professor of the "*Conservatoire Impérial des Arts et Métiers de Paris*," are to be obtained from the publisher, J. Baudry, Paris.

We name these works because they give a greater amount of information upon the production of raw material and upon the progress of this industry than any other works within our knowledge.

Near this machine at the Exposition is another apparatus called *Expérimentateur Phrosodynamique*, to prove threads; and also a new machine to

prepare and open cotton before the ginning, both the production of Professor Alcan. This eminent engineer has made, as we have seen, a special study of the industrial questions which are of such vast importance to the American people.

IMPLEMENTS AND APPARATUS USED IN SILK THROWING.

The machines for *silk throwing* seen at the Exposition have remained, as far as fundamental principles are concerned, in the same general condition wherein they were at the origin of automatic industry; but they have been improved in their details, and in the harmony of their execution.

The Swiss manufacturers, especially, have exhibited a remarkable collection of implements in this department.

The assortment as thus exposed, and which is employed in the best factories, consists:

First—Of series of "*tavelles*" to wind, clean and equalize the threads during their automatic winding off.

Second—Of an apparatus to unite and double the threads, with a mechanism for instantly stopping the machine whenever a thread breaks.

Third—Of a machine to give the first twist to the double threads in the direction determined for the production of the tram or woof.

Fourth—Of a second machine to retwist together two threads already twisted separately, thus producing the organzine.

The object of these machines, so simple in their construction, is to obtain constantly an evenly twisted product—that is to say, worked in such a manner that each unit of length receives exactly the same number of turns.

Now, the realization of this object was not effected without encountering difficulties, which have been completely surmounted by the Swiss and French mechanicians, judging as well from the machines as from the magnificent threads exhibited.

This class of machinery is the more advanced because the machines to convert silk are, of all others, the cheapest, and this results directly from their greater simplification.

The "throwing" the threads of silk has several objects in view:

First—It gives them a sufficient resistance to admit of their being boiled in soapy water to remove the gummy matter, so that they may receive the dye better and give greater brilliancy than if they had remained in the raw state.

Second—By the ungumming the silk acquires the desired suppleness of silks called "boiled," while if it retained its gum it would be stiff and rough, like the silks employed in "bareges," for example.

Third—The "throwing" the silk is intended to give a certain peculiar appearance to the threads, which partly determines what is called the grain of the stuff.

Moreover, when these threads are intended for brilliant tissues, such as satins, the two successive torsions which constitute the organzine are combined in such a manner that the last, which will be the most appar-

ent, should have the least twist in order to preserve the brilliancy of the stuff.

The combination is inverted if the object be to make threads for "taffetas," gros grain, gros de Naples, etc.

The work of silk growing, by the combination of the varied conditions it requires, necessitates the possession of such accurate knowledge, and the use of such rare skill, as to constitute it a special art.

SIMULTANEOUS REELING AND THROWING.

It has been frequently attempted, and is sometimes still sought, to unite in one single operation the winding off of the cocoons and the throwing of the silk. Notwithstanding that for a long time the solution of this problem, which apparently presents no serious difficulty, has been considered as the philosopher's stone of silk industry, the effort has not been abandoned. Still in this department, as certain mechanism exhibited by the Italians and French attest, the problem offers but little interest or encouragement, as for example: To wind off the cocoons and twist the thread at the same time the raw silk or "*grège*" is issuing from the basins, instead of being passed on to the reels by one simple movement, is rolled around bobbins having a rotary motion, in order to give torsion to the threads.

It is necessary to direct two of them together upon one bobbin to produce the tram; consequently the intermediate operations are all suppressed and condensed into one single process, and hence an apparent economy; but, in fact, this economy disappears and the new mode becomes comparatively expensive, because the production is considerably reduced and because it requires a much larger personal attention.

A few figures will suffice to demonstrate this. To produce the grège the velocity most suitable is such that one workman throws out at least a length of five hundred metres of thread a minute.

When the thread is twisted at the same time only five hundred revolutions are given per metre to it in the majority of cases. Suppose a velocity of three thousand revolutions to the spindles, only six metres will be produced instead of five hundred a minute. It is true a workwoman can superintend four threads instead of one, but it will still be necessary to employ twenty times as many spinners in this case as when the production of the grège was in question.

Now this augmentation of expense is much more considerable than the economy realized by the suppression of the intermediate operations. But the most serious difficulty consists in the imperfection of the results. The slowness of motion in the simultaneous twisting and throwing does not permit a suitable development to be given to the thread, nor a sufficient tension for the entire unwinding, which causes the dark aspect of the product already spoken of.

In a word, by the combination of different operations, the workman is not able to bestow upon his task that care in cleansing and purifying which is performed by the automatic system and by hand as it exists in careful silk throwing.

Thus the apparent progress, so enticing in appearance, demands an expense much more considerable than that of the separate operations mentioned, and can only give inferior products of inconsiderable value.

In order that they may be forewarned, these facts are worthy of special notice by the American people, who are only beginning to turn their attention to this branch of industry.

However, all new attempts may reach ultimate success; and if it be true that for beautiful normal products the simultaneous twisting and throwing must be rejected, there are cases where they may be employed and, indeed, where they begin to be employed with a certain success; as, for example, when the cocoons are of an inferior quality, and difficult to wind off, such as double cocoons, so that the operator in twisting them directly can, at the best, obtain silk of only a very inferior grade, fit only for working common *cordonnet* (braid, binding, twist, lace, etc.) In such case the simultaneous process may be advantageously used. And, indeed, cocoons, wound and doubled and twisted simultaneously, in order to make directly from them certain products intended for *passementeries* or trimmings, have no need of such careful superintendence as would be required in regard to the same cocoons when intended to produce the more beautiful silks. A single person can attend a greater number of ends (or bouts), inasmuch as these coarse articles are far less liable to break.

There are then two conditions which permit the employment of the simultaneous system with advantage:

First—When the object to be obtained is not an imperfect grège, but a cordonnet for trimmings, of a sufficiently good quality, and at a price relatively high; and

Second—In cases where the expense of hand labor is considerably reduced, in consequence of the character and destiny of the special product, one person under such circumstances being able to produce very much more than he otherwise would by the ordinary process.

PRODUCTION AND UTILITY OF SILK WASTE.

The different transformations undergone by silk, up to this point, and those it has still to undergo until it arrives at a state of "stuff," occasions "waste."

This waste presents itself in different states. Those resulting from the operations which precede torsion offer parcels of raw filaments (*agrégé*), not twisted, known by the name of "*frisons*" or waste from reeling cocoons.

There are *frisons* of different qualities, according to the period of preparation given to them, or according as they proceed from cocoons, "*de graines*," or "*percés*." In this case the waste is more particularly designated by the name "*golette*," from which are made coarse silks, called "fantaisie," "chappe," etc.

The waste proceeding from the different manipulations, commencing with the winding off of the *grège* in the throwing, and the operations of weaving is generally composed of twisted ends, and is known by the name of "*bourre*."

These two sorts of *débris* have been long utilized. They are divided, cleansed, ungummed, and then equalized by cutting to prepare them for twisting, as we have already said. But there is another kind of waste, long neglected, and which has commenced to be utilized only since the very high price of silk, namely, the "*chiffons*," or rags of this material. Establishments of this kind are very rare; one exists in England, one in France and a third in the United States. We have no knowledge of any other.

As to the winding of waste, we must limit ourselves to pointing out a

certain process, of which threads of this kind have been the subject as well in France as in Switzerland.

NEW THREADS OF SILK BOURRE.

We have seen in the show-cases of the exhibition of these two countries, threads from *bourre* (a sort of "shoddy"), which rival in the beauty of their appearance the most lustrous silks, and at one half the price.

These results are attained by attention to details in the manufacture. All these operations have attained remarkable precision, and have been executed conformably to the indications of science, and by the application of certain preparations under special conditions. When the threads have been produced with the greatest care from waste, well purified, well combed, perfectly prepared and spun, the workman then proceeds to apply a thin layer of coating of warm gelatine or isinglass to the thread when stretched and in motion.

The drying and ulterior "*chevellage*" completes the work, and imparts to the products that peculiar brilliancy so much esteemed, and that elasticity so indispensable to manufactures of this kind.

The unusual care and attention brought to the working up of waste have been necessitated, as we have said, by the rise in the price of this material. It is not many years since the waste, which at present sells at from twelve to fifteen francs, was worth only four or five francs the kilo.

This fact alone is sufficient to justify the efforts to utilize waste of every description.

Formerly, certain sweepings of threads were thrown on the waste heap, which the workmen knew not how to unravel; but for the disintegration of these, the most ingenious and effective machines have been devised.

These machines take the rag or piece of silk at its entrance, restore it at its exit in the form of filaments, carefully classed in lengths and fineness, proper to be submitted to the machines for decomposing the *chiffon* or rag.

The inventors have not exhibited these machines, from fear of imitation by countries where inventions are not protected by patents. Prussia and Switzerland are in this condition, and they are precisely the countries which would derive the greatest advantage from their use.

DYEING AND SURCHARGE OF THREADS.

We have but little to say on the dyeing of silk, so brilliant in itself, and advanced to such an extraordinary degree of perfection.

No kind of material offers more splendor in this respect.

The invention of those colors derived from coal has principally contributed to or caused this revolution in the art of dyeing. The new materials have permitted dyers to obtain colors of unprecedented splendor, combining shades of marvellous variety with extreme delicacy. Looking through the Exhibition, we might almost say, in the presence of the results obtained in this direction, there is now nothing impossible. Still, close by the side of products so admirable in respect to dyeing, we saw, on the contrary, much still left to be accomplished. We refer to the attempts made for some time to gild and silver threads of silk. Some specimens of silk of this kind exhibited denote processes still in a crude

state, which do not yet supply any product capable of being used advantageously.

Another branch of dyeing is, on the contrary, in a very advanced state; sometimes too advanced.

Reference is here made to the means used to surcharge silks, so as to make them gain, if one wished it, as much as one hundred per cent. upon their normal weight.

This process has an honest origin, and sometimes its applications are honest; but it is not unfrequently used for purposes of gross deception. For example, when the threads and tissues are sold by length or by surface, these surcharges have no other result than to give a certain appearance to the article, while the thickness of the tissue plays no other part here than that which frequently results from the stiffness of stuffs of this sort, without any detriment to the buyer. But, on the other hand, when the threads and even the tissues are sold by weight, it makes the purchaser pay the price of silk for a considerable quantity of foreign matter which, sometimes, has not a fortieth part of the value of silk.

Nevertheless the authors of these operations, whose main object is to give increased weight to silk, are tolerated and even rewarded at the Exhibition, under the pretext that they thereby aid in meeting foreign competition.

These are specious pretexts which ought to be made known. As these efforts for facilitating the best employment of waste are worthy to be pointed out and recommended, so, on the contrary, these reprehensible practices are to be deplored and condemned.

THE WEAVING OF STUFFS OF ONE COLOR, VELVETY OR PILED FABRICS.

We observed at the Exhibition some plain silks made in France, Switzerland and Northern Germany, leaving nothing in this department to desire.

This result proves that if the automatic working of plain silk goods be not yet general, it results from special causes in the organization of the fabrics, rather than from difficulties in the execution of the work, for the perfect specimens hereinbefore mentioned were exhibited with the special notice that the weaving was done by motive power.

We examined with care the looms by which this result has been attained. Looms of this kind were exhibited in the English, French, and Swiss sections of the Exposition. The two latter nations have more especially applied themselves to the construction of looms intended for silk weaving, whilst the English looms, being adapted to more general use in the weaving of almost every kind of fabrics, are not so well fitted to the weaving of silk, which demands particular care and special adaptation.

The Swiss and French also make the *canettes* for the tram, the *ourdissoirs*, destined to dispose the *chaine*, and the arrangements for raising and advancing it on the loom

They thus have an appearance peculiarly their own. Competent men quickly observe that certain alterations, which influence only the proportions and relations between the different means generally used in all looms of this kind, and, in this case, important modifications.

These changes are especially employed in utilizing the peculiar elasticity of silk, so as to obtain from it the regularity which the interlacing of threads in silk goods demands, and also to be better able to secure cleanness, purity and brilliancy.

By the side of the machines and apparatus of which we have just spoken was exhibited a French machine, to polish automatically these same stuffs. This machine, alike ingenious and efficacious, possesses all the advantages of hand polishing, acting with only a little polish and in parts.

All these machines have great value and interest for American industry; and it is the same with the automatic looms for the manufacture of velvet stuffs, such as plush for hats, etc.

These automatic looms may be arranged in two classes. The one class works two pieces at one time—the other only one. Both have their special object and employment.

The loom which makes two pieces at the same time is furnished with three chains superposed, the one above the other, at suitable distances. The middle chain is intended to supply the thread which, by the *coupé* or cutting, forms the velvet surface. This middle chain, or *chaine de poil*, has a much greater length than that of the other two. It is proportional to the length of the piece multiplied by the height of the *duvet*, and by the number of *boucles* or loops necessary to each of them.

The interlacings in the weaving of these three *chaines* are such that they form two *toiles* or fabrics, between which is interlaced a certain height of the thread of the *chaine*. This height is exactly and automatically separated in two by the middle one in order to supply the velvet surface to each piece, which, thus separated, is then rolled upon a roller as fast as the section is worked.

Various articles in silk, and especially the most beautiful plushes for hats, are executed in this manner.

This system is more particularly suited to plain articles wherein the *duvet*, without the intervention of the *baguettes* or small rings employed in hand-weaving, necessitates a certain height, and can be employed to manufacture *façonnées* or figured stuffs and very smooth velvets.

The automatic work in smooth and fine velvets has yet only reached the extent of weaving one piece at a time. The operation is effected by the insertion of irons to determine the *boucles* or loops which remain closed in the work of velvet *frisé*. The iron is withdrawn when a certain number of *boucles* or loops are fixed by interlacements.

If, on the contrary, the object is to make velvet *coupé*, it is effected by cutting at the top of each of these loops or *boucles*.

Thus, to the ordinary functions of weaving machines, it is necessary in the weaving of velvets to add combinations, which place and withdraw *baguettes* to form the *frisure* in which these *baguettes* are placed, and act as a knife or plane to cut these same loops in order to produce cut velvet.

These problems have been solved in the most successful manner by the looms at the Exposition. It need hardly be suggested that a personal examination of the machines above mentioned would give a far clearer idea of their structure and mode of operation than could the most elaborate description. The same may be said of the machines hereinafter noticed.

If from plain articles we pass to striped and plaid silks, in the execution of which Scotch industry has long excelled, we shall encounter some difficulty and embarrassment in choosing from among the numerous automatic looms now multiplied to a marvellous extent, permitting the frame to change spontaneously a greater or less number of trams of different colors. The numerous looms of this kind exhibited demonstrate the activity and necessity of research in this direction, and also the

energy with which science and skill are employed on all those problems whose solution can lead to utility and economy.

It is not only in articles of an ordinary character that this tendency is observable. It is no less remarkable in silks of the richest devices, and especially in the most beautiful articles of Lyons, adapted as well for dresses as for furniture.

THE WEAVING OF GRAND FAÇONNÉS.

It is worthy of note that despite the increasing dearness of silk thread these silks, so very rich in all the perfection of their manufacture, are not sensibly increased in price.

Never, perhaps, have the stuffs of Lyons displayed more taste than now. Never have they or those of Tours exhibited greater beauty and perfection.

Among the silks for toilets we remark, especially in the *façonnés* or figured goods, a fineness and neatness that seemed almost impossible till now, which denote a superiority to which French industry alone has yet arrived.

There are also combination *armures* and *moirés* as the basis of tissues, demonstrating that there no longer exist difficulties in this direction.

It was sufficient to traverse the gallery of the French machines to be fully impressed with these views. Ingenuity has been tasked in a thousand different ways to simplify the elements of the Jacquard loom and render it capable of producing still more extensive results.

It secures economy in the use of the cards, necessitated by this manufacture, by diminishing the surface of holes, or *trous*, and of the folds which separate them, in such a manner as to make them contain more in a given surface.

Besides the cards entirely dispensed with and replaced by a simple sheet of paper, further on there is an ingenious combination which permits the same card to serve twice successively and to produce two different effects, and enables it also to economize at least fifty per cent. of cards.

There are savings of another kind in the automatic execution of stitching, due to the introduction of an additional organ into the frame to make *façonnés le battant brocheur.*

Blonde, an article in silk imitating lace, is also exhibited by both England and France. This article, made automatically, and which for years has displayed the most elegant designs, now presents devices the most capricious and seducing. These results are attained by the combination of the net lace frame with the principle of the Jacquard frame, skillfully modified in its applications.

Until now, manufacturers were content to vary the designs and multiply the figures, and hence a single loom of this kind produced with considerable economy hundreds of *bandes* at once. But that was not sufficient. The industry of Calais (the centre of the *tulle* and *blonde* trade of France) had just created an article essentially different from ordinary lace and *blonde.* It was obtained by the interlacement of threads acting exclusively in the direction of the *chaine* in the *tissues à maille,* to which we have alluded.

A transversal thread of the tram made a part of the tissue, the physiognomy of which and the mode of interlacing being thus essentially modified. The modifications, proceeding from an additional cross-thread,

could be carried upon the riseaux from the bottom, and those of the *façonnée* at the same time.

A new and vast field thus opens to the specialty of reticular tissues, already so rich in fancy articles. Perhaps also this kind of stuff will pass from silk to cotton, and to other substances, and ultimately give results analogous to those of a species of gauze, which is produced, if not with great difficulty, at least with great slowness and at considerable cost.

The new article may probably serve as tissues for sifting flour and all kinds of plaster substances.

The mechanical means by which these results are attained, and many others into the details of which we cannot now enter, combining with the use in a greater and constantly increasing extent of cheap silks, demonstrate a gratifying progress in this direction.

SILK RIBBONS.

We have only spoken briefly of ribbons from a technical point of view, because this industry was represented at the Exposition by but one loom, that for velvet sent by M. Joyot June.

As to the products, they were exhibited for the most part collectively by the manufacturers of Saint Etienne, Basle, Prussia, Alsace and other sections.

Saint Etienne contains ninety thousand inhabitants, and with its suburbs gives employment to twenty-three thousand six hundred and twenty-two persons, of which the greater part are women and girls. It has fifteen thousand looms. According to the Chamber of Commerce, the value of its productions for the year eighteen hundred and sixty-six was sixty million francs (twelve million dollars), five sixths of which was disposed of to the United States, England, and to the City of Paris.

The Canton of Basle, with a population of sixty-five thousand inhabitants, has about six thousand looms for the manufacture of ribbons in the City of Basle alone. The manufacturers, many of whom are of the first order, employ from three hundred to four hundred hands each, while some few employ a much larger number. The United States take the largest quantity of these goods. Then comes England, whose trade in continental silks has greatly augmented since the last treaty of commerce with France. It was at Guebwiller, in Alsace, that steam was first employed in the manufacture of ribbons. One may see there a model ribbon factory, which employs six hundred persons, and contains two hundred looms, driven by a steam engine of thirty horse power.

DEPENDENCE OF EUROPEAN SILK MANUFACTURERS UPON THE EAST, AND ITS RECIPROCAL ADVANTAGES.

In view of the vast capital invested in silk industry, and especially in silk manufactures, by leading European nations, and the great number of their people employed in its prosecution, we may, in the presence of the crisis which has overtaken their silk husbandmen on account of the prevailing malady, pertinently ask what would have been the fate of the industry and the condition of its employés had not the extreme East been able to supply them with raw material in quantities sufficient to meet the exigency? And what advantages have not the nations of Asia derived from being thus brought into closer relations with the more elevated and advanced nations of Western Europe? Notwithstanding the

relatively low price at which they can supply their silks, they could not, a quarter of a century since, have anticipated so high a price as they are now receiving. Nor is this the only advantage resulting to these Oriental nations from this species of traffic with the silk manufacturers of Europe. It will teach them how to bring their products to greater perfection at home, and will stimulate them to prepare them with such care, and bestow upon them such an amount of skilled labor, as to draw from them all the value and profit that comports with the excellence of their nature.

RESUMÉ AND CONCLUSION.

The manufacture of silk as already analyzed, and as it exists in countries the most advanced in the art, embraces seven special branches of industry, viz :

First—The rearing of the silkworms.
Second—The filature or reeling of the silk from the cocoons.
Third—The throwing or spinning of the silk thread.
Fourth—The dyeing of the silk.
Fifth—The preparation of the silk threads for the looms.
Sixth—The weaving of silk goods.
Seventh—The spinning of waste silk.

These specialties, although consequent and dependent each upon the other, like links in a chain, can nevertheless be practiced separately, as is the case now in some countries.

We have demonstrated that some of these employments present more difficulties than others to countries which, like the United States, have not yet had sufficient experience therein. America can, however, hope henceforth to excel in these industries whenever she resolutely wills it and devotes to them that energy and skill which have placed her in the first rank among nations for certain of her inventions and manufactures. Let her not be disheartened at her efforts in this branch of industry, already most praiseworthy, and especially so in New Jersey, Connecticut, New York and Massachusetts, Pennsylvania and California; but let her press on and bring to this new enterprise that genius of investigation and energy in execution which have attracted to her so much attention, and attained for her such honorable distinction in the Universal Exhibition of eighteen hundred and sixty-seven.

Concerning the seven industrial branches employed in the transformations of silk, four can from this period develop themselves without any difficulty and soon take in America the high position already attained by cotton industry, namely:

First—The *throwing* of the silk, consisting in the employment of apparatus more simple and also less difficult to direct than the greater part of the machines in the factories of the United States. As to the raw material, it is as easy for the United States as for England to immediately supply herself with raw silk in China, Japan and even in the Levant and India. It is by no means improbable that at no distant day New York will become as important a depot of Asiatic silks as London now is. This may be accomplished via San Francisco through the medium of the Pacific Railway. The raw material having thus reached New York, will be distributed not only among our own manufacturers, but portions doubtless will be exported to foreign countries. Let the New World

take England as an example in silk industry. In less than half a century the silk manufacture of Great Britain (which does not produce a single pound of silk on her own soil) has arrived at such a degree of development as to give employment to a large amount of capital and to about one hundred and ten thousand looms, and direct occupation to some two hundred thousand persons, not including those engaged in the ribbon and silk hosiery manufacture.

Second—The dyeing of silk, already an established branch of American industry, needs only the encouragement to be derived from the establishment of co-operative branches to compete successfully with European skill.

The preparatory process of ungumming, cleansing and scouring are very simple operations and can be entered upon without delay.

Third—As to the regeneration and spinning of silky *waste* of all kinds, the United States find themselves in as good a position as most other countries to undertake a work of this sort, inasmuch as they possess equal facilities for procuring the *waste* and raw silk.

Who can doubt, therefore, that this will soon become an important branch of American industry?

In the manufacture of *passementerie* or trimmings, made to a great extent of this silk *waste*, there are employed in Paris alone eight thousand five hundred persons, producing annually products to the value of about eight million dollars.

This branch of industry throughout France occupies more than thirty thousand hands, and the entire annual production exceeds twenty million dollars. It is one of the occupations which, like the manufacture of ribbons and laces, employs the largest number of women and children, who earn from twenty to sixty cents per day.

The wages depend both upon the skill of the laborer and the nature of the work. Men earn from sixty cents to one dollar and fifty cents per day.

St. Etienne is noted for its fashionable dress trimmings; St. Chamond for its excellent cords, braids and stay-laces, employing about two thousand frames, or *métiers à la poupée*, in weaving stay-laces alone.

Most of these articles are extensively copied by foreign manufacturers from samples obtained in Paris. A system has been inaugurated there for promptly supplying samples of all novelties in silk fabrics, by the payment of a yearly subscription.

Fourth—With regard to the automatic weaving of plain stuffs, the United States already compete successfully with the more experienced nations of Europe. It is gratifying to know that the looms exhibited by American constructors have been highly appreciated for their ingenious contrivances and remarkable improvements.*

There remain, then, three specialties to excel, in which time will be necessary to obtain the experience requisite for complete success. This our countrymen will indubitably acquire in due season, if they will only bring to the task their usual sagacity and proverbial perseverance.

These specialties are:

First—The rearing of silkworms.

Second—The reeling of the cocoons into raw silk.

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* The looms exhibited by Mr. M. Opper of New York, Mr. George Crompton of Worcester, Massachusetts, and the knitting machine of Mr. J. W. Lamb of Rochester, attracted special attention, and a silver medal was awarded for each.

Third—The weaving of figured goods more or less rich.

We will speak of them in their order:

First—As to rearing of the silkworm. The most important element in this matter seems to be solved, namely: the culture of the mulberry. The various previous trials in the United States, already mentioned, have proved that large sections of the country are admirably suited to the growth of this tree, so indispensable to the rearing of the worm. And from what has already been shown, it may be inferred that if the breeding of silkworms has not been hitherto entirely successful, it is probably because that, at the periods of these early attempts, the agricultural population was not sufficiently instructed in details and therefore failed in some essential particulars, or lacked somewhat of that patience which the French and Italian cultivators bring to this particular pursuit.

But with an increase of experience, daily augmented by recruits to our population from the skilled labor of Europe and China, with individualities and talents the most diverse and elastic, with abundance of capital seeking investment; and, above all, with our fertile and remunerative soils and the superior climatic conditions of large sections of our country, it is not possible that new trials, judiciously conducted, should fail of success.*

Second—The reeling or *filature* of the cocoons into raw silk, which comes next in order, constitutes, perhaps, one of the processes the most difficult to teach, and especially in localities wanting in experience in this particular branch of silk industry.

The superiority of French and Italian silks over Asiatic silks is generally owing to the perfection of reeling. The success of this process depends, in a large measure, upon the care and watchfulness of the attendant, especially so far as the perfection of the product is concerned.

The rapid analysis above made of this kind of labor may assist us to understand the difficulty that besets this branch of the work; but we shall render it still more palpable by saying that the most experienced workwomen can hardly produce more than three hundred grammes (or twelve ounces) in good silk of the ordinary qualities obtained from five or six cocoons per thread, of which the quality or fineness is from ten to twelve *denier*, being twenty-four thousand yards per ounce.

Nevertheless, the country which produces the most skillful and careful spinners of wool and cotton manufactures will not despair of arriving eventually at the successful production of the many kinds of silk goods so clearly within its province.

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* As a proof how the introduction of this industry into a locality will enhance the prosperity of a whole people, an interesting fact may be cited from a recent French publication.

An officer in the French army having seen, during an Italian campaign, to what degree the cultivation of the mulberry tree and its attendant silk husbandry were enriching the population, resolved to introduce it into the little vale in the Commune of Valleraugue, where he owned an estate. Soon after the introduction, there were obtained there only some two thousand kilogrammes of very poor unsaleable cocoons. But after a few years, two hundred thousand kilogrammes, of an excellent quality, were produced annually, valued at one million of francs (say two hundred thousand dollars), which sum was mostly diffused among the rural laboring population of a village of four thousand inhabitants. The work was carried on in the following manner: The well-to-do proprietors gave out the silkworm eggs to the laborers, upon the condition that a quintal (one hundred pounds) of cocoons be returned for every ounce of eggs; also, giving them a sufficient quantity of mulberry leaves to feed the worms hatched from the eggs and a certain quantity more. The cocoons produced from the surplus constituted the profit of the silkworm cultivators.

Third—Though we feel assured that the industry of the United States will soon largely develope itself in the weaving of plain, striped and plaid silks, of velvets, of plain ribbons and other silk fabrics, simple in their character, yet we cannot conceal the fact that long and patient study is necessary to produce articles of sufficient novelty and artistic skill to compete with European industry, and more particularly with that of Lyons, which shines with a brilliancy peculiarly its own.

The great experience, cultivated taste and extensive knowledge of the French have made this specialty with them a veritable art.

The employment of Jacquard looms forms the basis of success in textile fabrics. But although this loom is universally in use, the effects it can produce have been nowhere pushed to so great an extent as in France, and particularly in Lyons.

The same may be said of Calais in its application of the Jacquard to blondes, or figured silk laces.

The Exhibition proves, by products of this kind, that henceforth to automatic labor almost nothing is impossible.

The magnificent specimens of lace there displayed, which imitate and well nigh rival the most exquisite and elaborate efforts obtained by the slow and tedious process of hand labor, are now the results of the motive power of steam, while the functions of the workmen are limited to a superintendence which becomes almost a sinecure on account of the admirable precision and perfect execution of these machines.

It is thus that fabrics, alike beautiful and useful, once ranked among articles of luxury, and accessible only to the wealthy, are each day rendered more available to the masses, contributing both to the prosperity of the producer and the gratification of the consumer. So far from despairing of ultimate success in rivalling the most elaborate and brilliant productions of Europe in this department of industry, the people of the United States may take courage from the fact that already a most successful beginning has been made in silk weaving.

Paterson, New Jersey, and Hartford, Manchester and Mansfield, Connecticut, are already noted for their extensive silk manufactures.

For many years past all the sewing silk and twist used in the United States have been of home manufacture.* The same is, in a measure, true of pongee handkerchiefs. Rapid progress is being made in the weaving of ribbons, braids, trimmings, fringes and various kinds of dress goods.

More especially may Americans be encouraged to prosecute this industry in view of the exemption of our Continent from the malady among silkworms now prevailing in Europe.

The devastation caused by the epidemic can hardly be overestimated. The steady advance of the malady threatens to embrace within its widening circles the silk-growing countries of the East, and thus cut off one of the main sources whence European manufacturers draw their supplies of raw material.

The calamity has thrown a pall over silk industry in all its branches. In the course of a speech on agriculture, delivered last year in the Corps Legislatif, M. Thiers said that the annual loss to silk culture in France, from this cause alone, for several years, has been upwards of one hundred million francs (twenty million dollars).

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* The Williams Silk Manufacturing Company, of New York, exhibited excellent "silk twist," for sewing machines, for which honorable mention was made, equivalent to a diploma.

Andrew Murray, Esq., in an elaborate report on "Products of Useful Insects," at the Paris Exhibition, printed in the Illustrated London News, of the sixth of July last, in speaking of the supply of *graines* (eggs) in the future, says:

"While things jog on as before from year to year, the cultivator will be slow to believe it possible that a time may come when no fresh *graines* (or eggs) are to be had. But the supply hangs on a thread; when every silk country in the world shall have become infected, then the supply must cease. And we are not far from that stage. Japan and Australia are the only countries now free. When they go the silk trade will collapse and silk be blotted from the list of textile fabrics. That, indeed, would be a calamity which would come home to ourselves. Our silk spinners and silk weavers, our ribbon makers, our silk mercers, and the thousands who depend on these trades for subsistence, would have their occupation gone, and ruin and starvation would await a large portion of our population. Surely, to avert such a result, not only in this country (Great Britain), but also over a large part of the Continent, deserves that every suggestion which promises escape should be carefully considered; and surely, if by any measure, however stringent, one country could be cleansed from the infection before its spread ends in a complete extinction of the race, and so the threatened ruin averted, it ought to be adopted."

Unlike almost all epidemics, this does not disappear from a locality after one or two visitations, but once established, it remains, while its virulence increases rather than diminishes. This extraordinary trait is attributed to the fact that the silkworm, by the law of its existence, is an annual, and therefore has no acclimated subjects, but presents to the epidemic a yearly supply of fresh victims. And in view of the geographical position of the United States, it may be noted that M. De Quatrefages, an eminent French writer, who has carefully studied this subject, expresses the opinion that, contrary to the general course of epidemics, this travels eastward rather than westward.

This mysterious malady, which seems destined to destroy silk husbandry in the whole Eastern Hemisphere, has not appeared in the Western. In view of its easterly course, and with the Pacific Ocean between it and the American Continent, and with our superior climatic conditions, it is hoped and believed that with precaution and care it will never reach our shores.

The soils, and especially the climate of those States of the Union where the cotton plant and the sugar cane have been wont to flourish, are peculiarly adapted to the raising of the mulberry and the raising of silkworms.

From obvious causes some of the long-existing industries of portions of these States will hereafter be necessarily modified to a noticeable extent. The culture of cotton and the production of sugar will not so exclusively engross the attention of their population as formerly. A portion of their capital and labor will doubtless seek new fields for the exercise of their energies.

Are not these facts an exhortation, an admonition even, to the people of the United States, to promptly avail themselves of their providential advantages, and by devoting a liberal share of their resources to the production and manufacture of silk, save this important and beautiful

industry from ruin, while at the same time they advance the prosperity of their own country and confer incalculable blessings upon the world.

In conclusion, the undersigned cannot refrain from expressing here publicly his thanks to Messieurs Arles, Dofour and Duseigneur, of Lyons, and M. Alcan, of Paris, as well as to the many prominent manufacturers and merchants in the different centres of industry in Europe whom he has visited, for their kindness in assisting to make the numerous researches which became necessary in the examination of this important and diversified subject.

The works of M. Louis Reybaud, M. Pasteur, M. De Quatrefages, the archives of the Chambers of Commerce of the various cities of France, Switzerland and Germany, and especially that of Lyons, have been valuable sources of information.

The report now submitted has swelled far beyond the limits anticipated at its commencement; but silk industry, in all its branches, now grown to such importance throughout Europe, the conspicuous place it occupied in the Exposition, its comparative novelty in the United States, and the prospect that ere long it will be firmly established and diligently prosecuted in many sections of our country, seemed to call for a careful and thorough investigation, and a full and detailed statement of facts and conclusions.

I have the honor to be, sir, very respectfully,

Your obedient servant,

ELLIOT C. COWDIN.

ADDRESSES, ESSAYS, ETC.,

DELIVERED BEFORE THE

STATE AGRICULTURAL SOCIETY,

AT THE FAIR OF 1867.

ADDRESS OF THE PRESIDENT, C. F. REED.

DELIVERED AT THE OPENING OF THE FAIR OF THE STATE AGRICULTURAL SOCIETY, SEPTEMBER 11, 1867.

Ladies and Gentlemen—Members of the State Agricultural Society: Another year has rolled around. Another bountiful harvest has been gathered. Another holiday for all the industrial occupations of the State is at hand. One year ago in this noble hall, consecrated to the interests of the workingmen and workingwomen of the country, I had the honor of congratulating you upon the cheering and happy auspices of a meeting similar to this. It gives me pleasure now to renew those congratulations under circumstances far more favorable, and auspices far more promising, than then. The past year has been one of encouraging prosperity to every industry in the State. Providence has smiled upon our country, and the horn of plenty has been filled to overflowing throughout the land. Under circumstances like these, it is right and proper that we should meet here as the representatives of all the industrial classes of the State to return to that Providence our sincere thanks for the many blessings we have received at His hands. It is right and proper that we should bring together the evidences of our prosperity—the fruits of our own individual successes—each in his or her particular department of industry, and offer them up as free sacrifices upon the altar of progress and improvement. These periodical industrial jubilees, these County, District and State Fairs, are among the most useful institutions of the age. I challenge the best and most successful educators the world can produce to point me to a school, college or university, established and conducted in the ancient or modern times, either upon the old or new continent, so well calculated to advance the great masses of mankind in a real, useful and practical education, or to urge on an enlightened and beneficial civilization of the nations, as these annual exhibitions of the products of the genius and industry of the country. The individual searcher for knowledge may spend a lifetime and fortune in visiting every city, town and hamlet; every grain, cotton, hop, tobacco or other cultivated field; every peach, apple, orange, lemon, mulberry or other orchard; every flock of sheep, herd of cattle or stable of horses in the State; in short, he may go over every acre of ground in our valleys

and descend into every mine in our mountains, visit every machine shop or manufacturing establishment in the towns and cities, and he will not see or learn more in years of time thus spent than he can see and learn in one short week at one of our annual State Fairs, when they shall be conducted as they may be, and patronized and supported by all the industrial classes as they should be. What is true as to the opportunities of any one individual for gaining information at these exhibitions is equally true of each one of the vast multitude whom I now see before me, and of every one of the greater multitudes who will each day visit the Cattle Grounds, and each day the Pavilion during the present week.

Viewing these Fairs in this their true light, and considering these their true objects, I ask where there is a man or woman who has a spark of true patriotism or a feeling of real philanthropy in his or her heart, who can be lukewarm in their support, or who will not make some effort to enjoy their pleasures and advantages?

The exhibition which we see before us to-night is a reflex of the present state of the civilization of one of the most enlightened nations of the world. It is a concentrated panorama of the industries and industrial occupations and productions of the Pacific coast. I invite each one of this vast multitude of people within this hall to take a cursory view of some of the articles here spread out before us for our examination and instruction. Go, if you please, into the lower hall, and you will see there samples of our great staples and vegetables—our wheat, oats, barley, corn, rye, beans, Irish and sweet potatoes, onions, cabbage, beets, turnips, etc.—all of which only a few years since we imported for our own consumption. Now there are none of these we do not produce greatly in excess of our home demand, and which we are not exporting to a greater or less extent. Another consideration may be mentioned in this connection—the quality of all the productions raised in this State is not excelled by that of the same articles raised in any other country in the world. For example, our wheat commands a higher price in the markets of England than that of any other country, and our vegetables are conceded by all travellers to excel the world for their size and general good qualities.

Step into the wine room and you will see a display of all the varieties of wine known to commerce that would do no discredit to the oldest and best wine countries in the world. The success of this industry in our State is such as to warrant the belief that we will at no distant day be the greatest wine producing country on the globe. Here we see, also, an exhibition of pickled, canned and preserved fruits, such as may challenge the best fruit countries to equal—we know they cannot excel them. This is another branch of industry of great importance to the State. A few years since and millions were required to pay the bills for our annual importations of these articles. Now our own people pocket these millions and devote them to the improvement of their farms and homesteads.

We also notice here samples of our butter and cheese, the products of our dairies. The exhibition in this department is not what it should be, and not what our rapid increase in the production of these articles demands; but they lead us to reflect on the significant fact that during the six years ending in eighteen hundred and sixty-five, we imported thirty-four million two hundred and twenty-six thousand six hundred pounds of butter, at a cost of nine million seven hundred and sixty-eight thousand three hundred and forty-six dollars in gold; and our annual importation of cheese for the last three of those years cost us sixty-nine

thousand seven hundred and seventy-two dollars, whereas, in eighteen hundred and sixty-six, the increased value of our dairy product over that of eighteen hundred and sixty-five was more than seven hundred and sixty thousand dollars; and it is estimated that the present year the cost of the importations of butter and cheese will not exceed two hundred thousand dollars, and will probably fall far short of that amount.

Our moving machinery is a very attractive and interesting department of our present exhibition. Never before has there been exhibited at a California State Fair, or at any other State Fair in the world, so great an amount of really valuable and practical mining machinery as we may see by stepping into the department devoted to that industry. Here we find hydraulic apparatus of every description, and mills for crushing and reducing the ores, and separating them from and saving the precious metals, all in operation—each performing the part for which it was designed. While upon this subject, we may state that even the great Paris Exposition contained nothing that would compare with the excellence and variety of minerals shown in the various cabinets exhibited here.

For the interests of our State, perhaps no more important display is seen here than that made by the enterprising proprietors of our various woollen mills. The articles exhibited here comprise all classes of fabrics made from wool. They are not only extensive in quantity, but for superior quality they may well challenge a comparison with the best manufactures of the Atlantic States, or even of England herself. As an evidence of which, the Mission Mills, of San Francisco, met the woollen manufacturers of the world in a closely contested struggle at the World's Exposition at Paris, and came off the victors, bringing away with them the bronze medal, the first prize awarded in that department. To these mills the State is indebted for millions of money now retained within the borders and circulated among the people, which but a few years since enriched the manufacturers of other States and countries. A new and important branch of this industry—the manufacture of knit goods of every description—has very recently been introduced by the Pacific Mills, and the excellence of their exhibition here bespeaks for them the patronage of an appreciative people.

The Pioneer Mills, besides their magnificent display of manufactured goods, have contributed one of the most important and interesting features of the Fair—a loom regularly running and turning off in the presence of the admiring multitude a superior article of flannel for the Winter dresses of our wives and daughters. We might, and perhaps ought in justice to contributors, mention other and equally important exhibitions in every branch of industry, but time will not permit. We, however, request each and all to accept our sincere thanks for the exhibitions made, and promise that full justice will be done in our annual reports.

There is one new and important branch of industry, however, well represented by our enthusiastic friend, Prevost—the pioneer silk culturist of California—which commands our attention. We behold here before us the complete exposition of the silk culture and manufacture, from the egg of the worm and the leaf of the mulberry tree to specimens of the best and finest silk goods. From the peculiar adaptation of our State to the prosecution of this industry, we may confidently anticipate that at no distant day California will be an exporter instead of an

importer of silk, and that the millions of money now exported for this article will be in circulation among our own industrious people.

Our stock exhibition—always superior—is this year, if possible, more excellent than at any previous Fair in the State. In this department California is rapidly becoming the banner State in the Union. We may well be proud of the judgment and enterprise of our leading stock-growers, and rest assured that the interest manifested by them in this important branch of industry will not be allowed to diminish.

In conclusion, we again congratulate the agriculturists, the miners, the manufacturers, and, each and all, the representatives of the various industries of the State, that they have chosen so good a country for their homes, and upon the bright and cheering prospects for the future, warranted by the increasing interest manifested in exhibitions like the present.

We are under many obligations to the various County and District Agricultural Societies of the State, and particularly to the Mechanics' Institute of San Francisco, for the success of our efforts in bringing together and inaugurating this useful, instructive exhibition.

The spirit which has animated them is worthy of the stern and enterprising people of which they are composed. The year eighteen hundred and sixty-seven may well be counted as inaugurating a new era in the material industries of the State. It is coming to be generally understood that local societies are important and necessary to stimulate local enterprise and emulation; but that these local societies can only find a voice to the other States and peoples of their resources and advantages through the State Society, whose annual reports find a place in all the important agricultural libraries of the nations.

When these facts come to be thoroughly understood and practically acted upon, our success as a State will be fully insured.

We would say, then, to the people of every county in the State—go on in the good work you have commenced, organize your local societies, make them contributory to the State Society, and you will bring immigration to our shores and build up a happy and prosperous people in the golden land of your adoption.

ANNUAL ADDRESS, BY JOHN BIDWELL.

DELIVERED BEFORE THE STATE AGRICULTURAL SOCIETY, SEPTEMBER 12, 1867.

Mr. President, Ladies and Gentlemen: Ordinarily an individual ought not to shrink from discharging the duties of any honorable position he may be called upon to occupy. On the contrary, it is and should be esteemed by every one an honor to be permitted to aid, to the extent of his capacity and opportunity, in useful and laudable undertakings. Whatever a man may engage to do, be it much or little, be it in the lowly rounds of common toil, or in stately halls exposed to the public gaze, he ought to labor with all his might, and bring to the task earnestness and sincerity of purpose. This is all I have to claim at the hands of an indulgent audience, for my errors may be too numerous, my offenses too grave, however unintentional, to receive excuse or pardon. I assure you, Mr. President, that I feel duly grateful for the honor conferred upon me by your society. I believe, sir, that I appreciate the responsibility assumed by the acceptance of your distinguished invitation to deliver the annual address on this occasion, but I feel constrained to acknowledge that I approach the task with much embarrassment and many misgivings as to my ability to offer anything instructive or interesting, much less new, upon a subject so old and so important as that of agriculture and kindred branches of industry with which it is inseparably connected. I cannot even say that I hope to meet, to any considerable degree, your just expectations. Whatever I may utter, however, shall be uttered in good faith. I profess a deep desire, if in my power, to serve the best interests of the State. However short of the mark I may fall, my aim shall be at usefulness rather than display.

Agriculture is the first and most important occupation of man, and embraces, in the general and practical idea of rural employment, both the cultivation of the soil and the rearing of useful animals. It is as old as sacred history, and may be said to date from the creation of man. "And the Lord God planted a garden eastward in Eden." Thus the Creator himself set the first example for man to imitate—a decree which in all ages he has been forced to obey or suffer the penalty. Man must plant or he cannot reap—he must earn his food or suffer the pains of hunger. Many of the prominent names of sacred history are identified

with rural labors. Noah was a husbandman and "planted a vineyard." "Abraham was very rich in cattle," and he "planted a grove in Beersheba." Lot "had flocks, and herds and tents." "Moses kept the flock of Jethro, his father-in-law." David was chosen and taken "from the sheepfolds." Solomon planted "vineyards," and made himself "gardens and orchards." Elisha was found "ploughing with twelve yoke of oxen before him."

But time will not suffice for prolonged exemplifications, which might be extended from ancient to modern times through all authentic history and present an imposing array of illustrious names who have practiced or encouraged agriculture and other kindred and useful branches of industry, including those of Cincinnatus, Cato, Pliny and Columella, and so on to Peter the Great, Arthur Young, Napoleon I, Washington, Cavour, Liebig and Lincoln. No nation ever has existed or ever can exist without agriculture. As population increases they must resort to cultivation, for the earth will not bring forth spontaneously sufficient to supply their wants. This is true of all civilized people, and in many instances of semi-civilized nations as well as barbarous tribes—as, for instance, the Chinese and other Eastern nations, the Incas of Peru, the Aztecs of Mexico and some other Indian tribes of North America. No nation can hope to endure and be an independent power with all the essential attributes of permanent nationality, unless its governmental fabric be built upon the sure foundation of its own agricultural and other industrial capabilities. Agriculture is so intimately related to and dependent upon the arts and sciences, and especially the mechanic arts, as to be inseparable from them. They must all flourish together and exist in harmonious co-operation as the several parts of a great whole. A state of civilization and advancement renders a division of labor absolutely essential, for in order to excel a man must concentrate all his energies on a single object. Without this, there could be little or no advancement.

Labor-saving machinery in almost all industrial occupations has become necessary—I may say indispensable—and in no one more than that of the farmer. It is demanded by the intelligent laborer—by the employer and the employed—everywhere. The time has passed and passed forever when laborers will go about, as they did in some parishes of Great Britain as late as eighteen hundred and thirty, "actually destroying every machine they could find." The law has become obsolete and can never be revived which forbids "any one to hold a plough who could not make one, or to drive until he could make a harness." What would the intelligent American freeman of to-day—the laborer—say if his employer were to be seized with the insane idea that machinery is useless—that modern civilization is no improvement on the good old customs of his forefathers, and were to order his heading machines, his reaping and threshing machines, while harvesting from standing grain and storing it at the rate of one thousand to two thousand bushels of wheat per day in his granary, clean and ready for the mill or market, to be thrown aside and the sickle, the flail and the winnowing-fan to be substituted in their place? Why, the laborer would desert such an employer instantly. The farmer who has the best machinery, the latest improvements and keeps up with the age, can hire cheaper and his men work more cheerfully and better—other conditions, of course, being equal. To make machinery mines must be wrought, the metals must be elaborated and worked into all the innumerable forms and inventions as seen in works of art and skill everywhere in daily use.

Some men are destined to excel in one thing and some in another.

Even nations have their peculiarities—their advantages and disadvantages—and it is found not only convenient but necessary to transport their respective products to other countries. This is commerce. To carry it on there must be vessels to navigate the ocean, and to construct vessels there must be architects and all the various materials required in naval architecture. The products of one country may fail from drought, war or other cause, and when this occurs the deficiency must be supplied from abroad. The necessity is often imperative in order to prevent starvation. So it is with every useful pursuit and profession. They are alike dependent on agriculture and essential to its prosperity. It takes them all to make up a grand whole of national prosperity.

This society, therefore, acts wisely and aims to foster the best interests of the State when it invites all to meet here upon a common level and compete, with a proper spirit of emulation, in the results of their respective professions and occupations. This is a State institution, and I am happy to know that it has worked its way up till it has become an object of State pride. It has grown up under trials and discouragements, but having surmounted them by the indomitable will and energy of those intrusted with its keeping, it is more and more endeared to us every year, and gives higher and higher promise of usefulness. None will now be so bold as to deny that the annual Fairs held in this State have done more than all else besides to create a lively interest in and to encourage the development of our agricultural and mineral resources. This institution has claims upon and should, as I doubt not it will, be sustained and encouraged by the State for the benefit of all interests and occupations. After witnessing these scenes of beauty and wonder, no one can fail to return to his home glowing with a spirit of emulation and a determination to do better than he has ever done before, and with a purpose to renew, as the earth shall accomplish the annual circuit of its orbit, his devotions at this shrine of industry. In no way can he better promote the public good than by being a worthy and active member of the State Agricultural Society and participating in the annual exhibitions of its industry.

The spirit of laudable rivalry which has brought you here, my friends, is not confined to this State, or to our country; it is one of the prominent and hopeful signs of the times. It is not only national, but international. It has culminated in the grand Exposition of industry of all nations, now being held at Paris; but the culmination there is but temporary, for the next World's Fair is bound to surpass it, whether it be held in England, Russia or the United States, or, I might say, in New York or San Francisco. By these international reunions nations are fighting far more important battles than they have ever fought with arms; they are actually conquering ignorance and battering down the fortress of prejudice, and thereby promoting peace by annihilating the causes of war. Prejudice arises from ignorance and has been the origin of most of the wars which have desolated the earth. Frequent intercommunication is of vital importance to nations, and of scarcely less moment to the different parts of nations, especially large ones like our own, in order to dissipate the cankering effects of prejudice before they ripen into open hostility.

No plan has ever been, or ever will be devised, according to my judgment, better calculated to attract the masses—I do not mean the classes—I mean the "high, the low, the rich and the poor"—than these grand industrial exhibitions. Would anything but a State Fair throng this spacious hall with such multitudes of the industrial and intelligent peo-

ple of the land; with such an array of beauty, grace and virtue; with such a prospect of blooming and youthful faces, smilling with happiness and radiant with intelligence? Would anything other than such an exhibition as this bring together the old and the young and the middle aged, the citizen and the stranger—in a word, all worthy, amiable classes, sexes and conditions, and all of them patriotic, I hope, for it seems almost impossible for any one to witness such a scene as this and not feel his inmost soul to burn with patriotic emotion. There is little doubt that Europe would have been, ere this, in a blaze of revolution were it not for the grand Exposition of Industry which is now attracting hundreds of thousands from every quarter of the globe and making the French Capital the scene of friendly greeting between the people of all nations. Even the crowned heads of Europe found it consistent with their feelings of propriety (or pride) to go upon this pilgrimage and bow at the shrine of peace. As a compensation for their trouble, however, they found themselves for once in respectable company, for they met there citizens of the United States of America—real and true sovereigns who will never, I trust, bow the knee to tyrannical power, but who feel it a far higher and purer pride, let us hope, in wearing their own civic crowns of American citizenship, even amidst all that regal splendor, than the most haughty and defiant monarch of them all.

The benefits to be derived from exhibitions of this character cannot be over estimated. We ought to encourage, by every means in our power, State, District, County and City Fairs, where all can go and join in harmless but useful emulation, and thus do all we can to banish prejudice from our peaceful borders. It is proper on an occasion like this for us to inquire more particularly what can be done to advance the interests of our own State? With all the known and acknowledged advantages of California in respect to fertility of soil, serenity and salubrity of climate and beauty of general topography, there is still enough, even here, for man to do. We have swamp lands to drain and fortify against periodical inundations; we have sterile lands to reclaim by irrigation and the application of fertilizers; we have to construct canals, roads and highways for travel and commerce, and many other indispensable improvements—and all these are to be brought about only by the one now universally acknowledged source of all true wealth—labor.

We are led to inquire, how can these things be best and most speedily accomplished? That the drainage of the vast tule marshes is important, nay, a necessity, none will deny. That these vast regions, which occupy the central and most accessible part of our great interior valleys, would be the very best lands as regards fertility, and their capacity to yield almost everything required to supply human wants, is an undeniable fact. Can these tule lands be reclaimed, is a most vital question to the State. It is evident that if the work be ever done it must be done upon a system commensurate with the magnitude of the obstacles to be overcome.

It is not my purpose to overlook any part of this magnificent State. It would be wholly out of the question, however, within the limits allotted me on this occasion, to attempt to particularize or expatiate on the beauties and glories of particular localities. They have often been described in swelling periods and glowing narrative, as far as pen and tongue are capable of portraying their unrivaled excellences. Their names—at least many of them—are co-extensively known with that of California itself, and others are fast marching up into prominence. Who has not heard of Los Angeles, famous for its wines and oranges? Of San Gabriel and San Luis Rey? Who has not heard of San Diego, with one

of the loveliest of climates to be found within the borders of our State, and with the castor bean growing perennially and spontaneously along its sandy shores? Who has not seen or heard of San Fernando, noted for her grapes and the Agave Americana growing in her Mission gardens? Who has not heard of Santa Barbara, of the asphaltum along her coast, her genial climate, and the world renowned Dominguez grapevine growing in the adjacent valley of the Prieto, and yielding annually over fifty tons of luscious grapes? Who has not heard of San Luis Obispo, and of her salubrious climate, her soil, and her palm trees flourishing in the open air? Have not all heard of and many seen the Salinas and Pajaro Valleys, and Santa Cruz, its climate and scenery? Who has not seen or heard of San José, Santa Clara, Napa, Sonoma, Petaluma, Santa Rosa or Russian River? all celebrated for their vineyards, fruits, general productiveness and inimitable beauties of climate and landscape. In even a cursory statement of the leading features of the State, the names of Indian Valley, Honey Lake, Visalia, Tejon, Kern River, King's River, Sierra Valley, Scott's and Shasta Valleys, Round Valley (or Nomecult), Surprise Valley, and many other places and valleys, some of them well and favorably known, and some of them just expanding into prominence, ought to receive more than a passing notice.

But, as I said before, time and space would fail me were I to undertake to enumerate, much less describe, the diversified excellences of all the places deserving of notice. They are all susceptible of a high state of improvement, and must be seen and examined in order to be understood and appreciated. Time and enterprise alone can, and surely will, unfold the wondrous capabilities of this State.

But I was endeavoring to call attention to the swamp lands and tule marshes, lying, as it were, in the very center of this great central valley, and a question of momentous interest to the State inseparably connected with them, namely—the possibility of their successful reclamation. On the practical solution of this problem depends the salubrity of many localities, and, to a vast extent, the wealth and prosperity of the State. The great central figure of the State, if I may use the term, is this grand and gorgeous valley of the Sacramento and San Joaquin. And it is a real valley—not like the monotonous and common-place tracts of country drained by certain streams and known in the Atlantic States and other parts of the world as valleys; but a real valley, traversed by noble streams and surrounded by magnificent mountains, and on a scale so ample that, literally,

> ——"distance lends enchantment to the view,
> And robes the mountain in its azure hue."

This valley stretches northwesterly from Tejon over nearly six degrees of latitude, having the average proportions of thirty miles in width and five hundred miles in length. It is bounded on the east or northeast by the Sierra Nevada Mountains, rising from five thousand to more than fourteen thousand feet above the level of the sea, many peaks of which, clad in perpetual snow, look serenely on the valleys lying at their base and blushing with almost tropical fruits and flowers, and rejoicing in almost perpetual Spring, Summer or Autumn. These mountains—famous for their mines of gold, and copper, and silver, and for the largest trees in the world, some of which are more than ninety feet in circumference, and for their forests of pine (including the celebrated sugar pine), and spruce, and fir, and for their abundant snows, falling sometimes ten

to twenty feet deep and frequently drifting to the depth of thirty to forty feet; and for unrivalled fruits, including nearly all the varieties known to warm and temperate climates—are rent into chasms and corrugated by the channels of mountain torrents which rush down to swell the volume of the Sacramento and San Joaquin Rivers. These gorges have generally steep, sometimes precipitous, sides, ranging from hundreds to thousands of feet in depth. This valley is bounded on the west or southwest by the Coast Range, not so high as the Sierra Nevada, except to the north, where it has many features in common, including a vast system of steep and precipitous ravines and cañons, through which the streams flow to the Sacramento River.

The area of this grand interior valley of the State is not less than fifteen thousand square miles, or three or four times the size of the famous valley of the Nile. This extent, though less than one tenth of the surface of the entire State, will be amply sufficient, when developed, to sustain a population of more than a million of souls. The two principal rivers—the Sacramento and San Joaquin—coming from opposite directions, severing the Coast Range Mountains and disemboguing through the Golden Gate, drain a vast region, in addition to the valley proper, comprehended by the margins of the valley and the summits of the before named two great ranges of mountains. The water sheds or summits of these two ranges cannot average less than eighty miles apart. The superfices drained by the said rivers, including the valley, cannot, therefore, fall far short of, and may exceed, forty thousand square miles, or a superficial extent equal to the aggregate areas of New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut and New Jersey.

It must be evident to every observing man, that whatever be the remedies resorted to to reclaim these tule lands and prevent devastating inundations, they must be upon a grand system—upon a scale commensurate with the great work to be accomplished. There must be a great design or system adopted, and then general and extensive co-operation to execute it. It will of necessity require vast sums of money and a considerable period of time. The intrinsic value of the tule lands in question is beyond computation; but aside from this consideration every inhabitant of the valley and adjacent mountains has a direct interest in their reclamation. They certainly ought to desire to see the landscape improved and beautified and the atmosphere freed from noxious exhalations. These lands were donated to the State for the purpose of being reclaimed. To throw up embankments of loose earth, to be swept away almost as soon as made, by every return of the annual floods, will evidently never accomplish the desired result. I desire to be understood. I blame no one for what has been done or omitted to be done. Experience is a good, but sometimes a very dear teacher. We have probably already seen enough to convince us that one or two dollars per acre will never suffice to construct the substantial works which will be required to withstand the periodical inundations. If reclaimed, these lands are destined to be worth, at no distant period, hundreds of dollars per acre. It does not become us to under-estimate the obstacles to be overcome. They are great, but not, in my judgment, insurmountable.

The entire surface of the country between the summits of the two ranges of mountains named, amounting to the combined areas of so many States, as before stated, is subject for six months of the year to plenteous, and often excessive rains. Upon the mountains are precipitated vast accumulations of snow. The innumerable ravines, gulches, and chasms, with their steep declivities and precipitous walls, operate

as so many funnels, and pour their waters down, simultaneously, towards the valley. When the snows happen to melt by warm and heavy rains, the combined waters converge into large and larger streams till they swell into mighty rivers, overflowing their banks, covering the plains like an inland sea, and causing destructive inundations. To devise some plan by which to prevent these ever-recurring visitations is, I hesitate not to say, worthy of the consideration of this society, and of every citizen who has the public interest at heart. The best engineering talent ought to be employed. Liberal premiums should be paid by the State for the best system of reclamation, and no considerable amount of money ought to be expended till a system has been adopted—a system that shall look to the ultimate and complete reclamation of all these lands.

It is not possible on an occasion like this, or within the scope of an ordinary address, to enter into detail or even indicate anything more than a few general ideas respecting such a plan as must necessarily be required for so great a work. My suggestions are given for what they are worth. I therefore may be permitted to say, generally, that I believe the floods and inundations before named can, in a great measure, if not entirely, be prevented; and, consequently, that the swamp and tule lands can be reclaimed by the use of three co-operative works or measures:

First—The building of reservoirs at all feasible points, to retain the waters in the mountains.

Second—The construction of canals, so made as to occupy the shortest possible distance between their termini, in order to secure the greatest possible amount of fall to a given distance, and thereby the discharge of the largest possible quantity of water by a canal or channel of given dimensions—and also in order to economy.

Third—The raising of suitable levees along the banks of rivers and streams to retain the remaining waters within their proper channels.

If all three of these measures do not suffice, it is certain that no one or two of them can.

And here I hope to be pardoned for referring to a subject intimately connected with the reclamation of the swamp lands—I allude to that of the reclamation of the dry lands, by the aid of irrigation. These same reservoirs and canals would, therefore, answer two great and equally important purposes. In this view they at once become doubly valuable. Aside from what are known as dry lands, comparatively valueless without irrigation, there are large tracts of land which by the aid of irrigation would more than double its yield, and the value of it would consequently be correspondingly enhanced. In other words, there can and ought to be entire co-operation in these two great and desirable undertakings. Both objects can be accomplished with little or no additional expense. I know there have existed among farmers differences of opinion as to irrigation, its effects and general necessity. Let me say I do not propose to raise any doubtful question. If there is any land that will produce as well or better without irrigation as it will with it, that land ought not to be irrigated. Those are not the lands which I propose to irrigate. That some have been irrigated to excess—used water at wrong times, and in wrong quantities, and in a wrong manner—and thereby injured their crops, is quite probable. Food and medicine, and many other things good in their places, if improperly used would have

a bad effect; but they ought not for that reason to be discarded altogether.

The art of irrigation is as old as the cultivation of the soil. "It was practiced from time immemorial by the ancient Egyptians and by the Assyrians and Babylonians, and has ever continued of prime necessity in the warm countries bordering the Mediteranean." It has been practiced from the remotest times, and by almost every nation of which we have any authentic knowledge, down to the present time. Nor is its use confined to warm, dry regions, such as Palestine, Arabia, Northern Africa, Spain, parts of South America and Mexico, for it is found beneficial and extensively used in humid England, in France, Prussia, Italy, and in many other countries both in Europe and America. There is probably no civilized or even half civilized people who have not found its use beneficial and often indispensable.

In some instances irrigation even antedates civilization—for instance, the Aztecs of Mexico and the aboriginal inhabitants of Peru. It was the custom of the Incas to go out annually to the suburbs of Cuzco, and in the presence of all the people consecrate their rural labor by turning up the soil with a golden plough. Prescott says of that country that "many places needed only to be properly irrigated to be susceptible of extraordinary production." The Peruvians had innumerable aqueducts and canals, one of which measured between four hundred and five hundred miles, and all these without an acquaintance with the use of iron. In agriculture, as in almost everything else, something useful may be learned from all nations without regard to rank in the scale of civilization. We shall find it profitable now to adopt the practice of irrigation in use by the ancient inhabitants of Peru for centuries before the discovery of America.

The Chinese are known to have practiced for many centuries both drainage and irrigation. It is said that "no other country can boast of an equal length of artificial water communication," and that in the construction of canals the two leading objects which they always kept in view were drainage and irrigation—that of navigation being entirely a secondary one. Some of their canals are of great length and prodigious dimensions. The one connecting the City of Pekin with the Yangtze-Kiang River is said to be from two hundred feet to one thousand feet in width and over six hundred miles in length. Perhaps the Chinese, should they be permitted to remain in this country and increase in numbers by immigration, may be profitably employed on works of a similar character.

Irrigation is sometimes brought about by natural causes; for instance, periodical overflows; but the lesson to be derived from them is, for that reason, none the less instructive. The famous river of Egypt is a striking example. For three months of the year—August, September and October—the Nile generally overflows its banks, bearing down a vast amount of decayed vegetable matter—the result of prodigious tropical growth and rapid decay, and copious rains under the burning sun of equatorial Africa—which, intermingling and combining, on its long journey of more than two thousand miles, with the silicious and calcarerous particles contained in the muddy waters, finally precipitates, in the form of slime or muck, all along the narrow valley on both sides of the river, covering an extent of four to five miles wide and between four hundred and five hundred miles in length. The wonderful productiveness of Egypt was the consequence. This was Nature's plan, her great laboratory, which, long ages before the explorations of Speke

and Baker "broke the spell which guarded the secret fountains of the Nile," had been in operation, analyzing and compounding, transmitting and distributing from her exhaustless storehouse the elements of fertility which rendered Egypt, above all other countries, famous as a land of corn and plenty.

What is true of the Nile will apply, in a greater or less degree, to all streams which overflow their banks, from the mighty Amazon and Mississippi down to the smallest rivulet that meanders through the meadow. These operations of nature teach us both to irrigate and to fertilize. As a bountiful Providence by these means continually renews and fructifies the earth, so ought man, as a co-worker with his Creator, who is ever repeating for his benefit these instructive lessons, to aid and improve the soil by giving it moisture to dissolve and prepare those ingredients which, chemical analyses have taught us, go to constitute the food of plants, and by restoring to it, as far as in his power, those elements of fertility of which he is continually robbing it by improvident cultivation.

All running waters contain more or less organic and other fertilizing matter in a state of solution. The further they run, and especially through alluvial regions, the more impregnated they become, and consequently more beneficial when required for irrigation.

Some parts of our own country are naturally so dry in Summer as to require to be irrigated even for cereals—for example, Salt Lake Valley, in Utah Territory. There are many other places in several of the States and Territories, and even within our own State, which can only be rendered productive and made to supply the wants of a vast population by a proper application of water. I am bold to assert it as my belief, founded upon observation, that the development of the agricultural capabilities of this State has hardly begun; and yet California has acquired a reputation for fertility and productiveness that is world-wide. An extensive and judicious system of irrigation is, in my judgment, the only thing that will ever enable the State to attain its highest development. All lands, as I have said before, do not require to be irrigated—some must even be drained; but I speak generally when I say that sooner or later the necessities of a growing population will demand increased production, and that this can only be brought about, to the fullest extent of which the land is capable, in the way I have suggested. This subject is therefore of vital importance to the agricultural interest of our State.

There is a vast aggregate amount of land belonging to the United States, lying between the summit of the Sierra Nevada Mountains and the sea coast, which can be made available only by a judicious application of water. We see the necessity of reclaiming the tule and other swamp lands. We have also seen, what must be evident to all who will give the subject attention, that both classes of land (the dry and the swamp land) can be reclaimed at about the same cost that would be required for either one of the said classes.

The conclusion is irresistible, therefore, that the waters of all the streams of the State are destined to become very valuable, and it is consequently important that they should, as far as possible, be stored away in the mountains in Winter, to be used when required in Summer. It will cost immense sums of money, of course, to construct the almost numberless reservoirs which will be required throughout all the mountain regions of the State. The General Government will never be able

to give its attention to this (to us) most important subject. The State alone can and ought to control it, and enact the requisite regulations.

Why not, then, ask of Congress a donation to this State of all lands within our borders, which are valueless on account of their aridity? By undertaking to reclaim the dry and the swamp lands at the same time, your labors will, I certainly believe, be ultimately crowned with success. If you go on with but the one—that is, the reclamation of the swamp lands alone—I have some apprehension that you may possibly fail, and that the swamps may continue to be the great source of miasmatic exhalations for an indefinite period. I know it will take time and effort to convince Congress that California is not wholly made up of flowery meads and fruitful vales, and rocks of silver and golden sands. It is difficult for men who have never crossed the continent, or had their souls elevated and their minds expanded by the influence of mountain scenery, to comprehend the peculiar but imperative wants of our State. But the earlier we begin to show them the necessities of our situation, and the more earnestly we urge the facts to sustain our petitions, and the more persistently we knock at the door of Congress, the sooner will our prayers be granted. Congress is generally disposed, so far as my experience goes, to act justly toward California, and it is only a question of our ability to convince them of what our wants are.

There may be said to be in the world two systems of agriculture, which have been adopted by different nations, according to the peculiarities and conditions of the soil and climate. These systems may be denominated as the northern and southern systems. Both have come to California, but by different routes; both are destined to be useful. Here may be said to be a common field where each separately, or both combined, may be beneficially employed. The southern system originated in warm, dry climates, where irrigation was indispensable. It was practiced in Palestine, Arabia and all the dry countries bordering on the Mediterranean, and found its way here from Spain and Mexico. The other system is derived from Middle and Northern Europe, where the climate and soil are such as to render irrigation less and drainage more a necessity, but both generally dispensable in ordinary seasons. This system accompanied our forefathers from Europe to America, and has travelled westward with our advancing columns till it came with us to the Pacific Coast. Both these systems, with variations to suit our varied conditions, will be required to develop the diversified capabilities of our soil and meet the conditions of our peculiar climate.

While the customs and practices of almost every country, in respect to variety of production and modes of culture, may be beneficially adopted in California—I mean to say, to a greater degree than in almost any other country in the whole world—there is something so peculiar in our surpassingly rich soils—in our wet and our dry seasons—in our dry and apparently barren lands, but which, when irrigated, astonish us with their productiveness—in the indomitable energy of our people—and, in short, in almost everything, as to require for California a new system of agriculture, and, as a matter of course, a new agricultural literature. Every practical farmer must be aware how comparatively inapplicable here are the periodicals and treatises on agriculture published in the Atlantic States and Europe. No farmer can afford to dispense with agricultural publications; but those published nearest the locality of his farming operations ought to be most valuable and consequently preferred. How would a paper published in Greenland or at Panama suit a California farmer?

I believe I am within the truth, Mr. President, when I say that California offers, taking everything into consideration, the grandest field for human enterprise to be found anywhere upon this round globe. Our resources—agricultural and mineral—are literally boundless. Five millions of people can be sustained and all find enough to do within the limits of this State alone. Population is what we want to carry this State forward in a career of progress and prosperity unknown even in the brightest periods of our brilliant history. We want common labor and skilled labor, and all kinds of labor except slave labor. We have beautiful plains to cultivate, malarious marshes to drain, waterless hills and valleys and slopes to irrigate, cottages and homes and stately edifices to build, roads and canals to construct, forests to subdue and forests to create, institutions to establish and build up, landscapes to embellish, and a thousand other things to do in order to unfold the varied capabilities of this new but most interesting region. Population is the great desideratum. Whatever may promote the immigration of an industrious and useful—useful is the very term I desire to employ—*useful* population, and the investment of capital in laudable enterprises, is worthy the attention of this society and should have the earnest and active consideration of the State.

We ought to encourage hither the best classes from foreign countries, and we want them as fast as they can become assimilated to us in language, customs, intelligence and love of republican freedom. The wealth-creating class—the laborer—is what I mean. It makes no difference whether the man labors with his hands or his brain, or both. Each is useful in his place—useful, as I said before, is the term that expresses my meaning. This term will include the farmer, the gardener, the stock raiser, the mechanic, the engineer, the minister of the gospel, the school-teacher and all the learned professions, and all who are willing to work and are capable of earning an honest living. It would not include the drones of the political and social hive—gamblers, impecunious speculators, professional politicians—all those who are too lazy to work and too proud to beg—nor would it include those who have been brought up to labor and through a false pride have become ashamed to acknowledge that they have ever labored, or that they know how to work, for fear, perhaps, they may not be thought to have descended from a rich ancestry. It would exclude the whole "shoddy tribe"—by this I do not mean those who have become wealthy suddenly or otherwise and still retain their senses—but that giddy, reckless class which cannot bear prosperity; those who, upon the sudden acquisition of wealth, start off on the road to ruin, affect aristocracy, wonder how bread and pies are made, and ask how turnips look when they are growing. It will not include those who loiter from day to day and from month to month around grogshops, setting baneful examples to the young, who are soon to be men and rulers of the land.

None but the useful should ever be encouraged to come to our shores. The Atlantic States and the principal countries of Europe swarm with the very people we want, and they are doubtless willing to come, or would be so if they but knew the facts and had the means to enable them to get here. What we want to do is to disseminate reliable information as to this country and its advantages, and then devise some feasible way for the people to come here. Our great hope is centered on the completion of the Pacific Railroad. But if possible to avoid it, we ought not to be obliged to wait for that event, or be entirely dependent upon it when it shall be completed. The difficulty lies in this, that all the

principal channels of travel are in the hands of monopolies, and are likely to continue to be so. It requires quite a fortune for a laboring man to make the journey from Europe to California. It takes as much to pay for the passage of a single man from New York to San Francisco as it does to purchase a farm of one hundred and sixty acres from the Government of the United States after he gets here. If there is any legitimate remedy for the obstacles in the way of immigration it should be sought for and applied. Agriculture and all our industrial interests are involved in this vital question. Hence it is proper to make this inquiry upon the present occasion.

We know that monopolies are always onerous and dangerous to the best interests of a people. They may be less dangerous, perhaps, in a free country like ours, where exorbitant charges will, in most cases, diminish patronage, beget opposition, curtail resources and thus wound, in the most vital part, soulless corporations. Excessive prosperity may produce extravagance, extravagance beget indebtedness and indebtedness dissolution. But the prosperity of a State—a great country like ours—ought not to be dependent on these fortuitous or capricious remedies. I believe there is a remedy if the people will it—a legal remedy—within the just scope and meaning of our national organic law. By what right does Congress regulate the carrying of passengers and commerce on the ocean? I do not pretend to be a constitutional expounder—I have no claim to legal learning and consequently no reputation as a lawyer to lose. I profess simply to feel, in common with other citizens, a deep and abiding interest in all that concerns the prosperity of the Commonwealth. There is but one clause in the Constitution which covers the case, but that clause is, in my judgment, ample for all purposes—domestic as well as foreign. In connection with the clause "to provide for the general welfare," the power is certainly, in my judgment, unquestionable. Congress has power, namely (I now quote the language of the Constitution):

"To regulate commerce with foreign nations, and among the several States, and with the Indian tribes."

What regulation, I ask, can be more important to commerce among the several States than to fix a reasonable limit, beyond which even extortion cannot go, to the charges for freight and travel? Our country is expanding into wonderful proportions. So rapid is our advancement that many who have already passed the meridian of life and are now witnessing this interesting scene, may live to see the United States the third nation of the earth in population and territorial extent, and the first in power, intelligence, goodness, and having all the attributes essential to make us a great, good, independent and happy people. We are already the first nation in the cause of freedom and the defense of human rights. The travel, commerce and free and untrammelled intercommunication between the States composing this vast nation of ours are of vital importance, in order to dissipate prejudice and bind all its members into one indissoluble and harmonious whole.

The prosperity of agriculture, of mining, of manufactures—in a word, of all interests, hinges upon the proper regulation of commerce among the several States. How important, then, it becomes that these regulations should be enacted and subject, from time to time, to amendment by the representatives of the whole people. And, thanks to the wisdom of our forefathers, Congress has ample power for this duty, soon to be of imperative necessity, to meet the growing wants of the entire country, implanted in the very foundation of our governmental fabric. That

the power now claimed may not have been exercised is probably true, but that is no argument against its existence. Many provisions in the Constitution have been permitted to lie dormant because Congress has not seen proper to provide for carrying them into effect.

This question does not concern California alone; the States upon the Atlantic slope will soon demand it. The monopolies so combine to fix the prices of freight—and the travel is inseparably connected with the commerce—that the farmer of Illinois is often obliged to sell his corn at a mere nominal price for fuel, when it would bring seventy-five cents to one dollar per bushel in New York.

The States themselves sometimes violate the Constitution by imposing burdens on the travel and commerce passing through them. The State of Illinois, for instance, charges seven per centum on the gross earnings of the Illinois Central Railroad, thereby taxing the commerce and travel of all the States to the extent of about half a million of dollars per annum. New Jersey and Maryland also raise large sums of money to support their State Governments from taxing the travel passing through them, a vast majority of which comes from the other States.

All public highways must be subject to regulation under the provision quoted, for they all are but links of highways passing through all the States. It was once said that all roads led to Rome. We can say that all roads in America lead to New York and San Francisco.

It is, therefore, undeniably wrong for the States to tax the travel and commerce passing through them. It is wrong for monopolies to do the same thing by unrestricted chartered privileges. Congress can never alienate the right to regulate commerce among the several States. Agriculture and all the industrial interests of California, and of all the States, are deeply concerned in seeing commerce among the several States freed from all odious and unjust obstructions, and property regulated by the only power having competent authority to do it, namely, the Congress of the United States. Unless this be so they must all, for an indefinite future, if not for all time, lie at the mercy of formidable monopolies. Even after the Pacific Railroad shall have been completed —aye, and after the Northern Pacific and Southern Pacific Railroads shall span, as they surely will, the Continent, and be coterminous with the northern and southern borders of this great country, from the Mississippi Valley to the Pacific Ocean—the danger will still remain. The railroad and steamship companies can and will combine to gauge their tariffs of charges by their own—I was going to say consciences, but corporations have no consciences—I will say by their own will, limited only by their love of money and their ability to extort it from the people at the expense of the prosperity and all the material interests of the whole country. The carrying business between the Atlantic States and the Pacific Coast is destined to be immense beyond computation. Shall it be suffered to go permanently into the grasp of unrestricted monopolies?

In view of the facts of the case, it must be patent to every one that Congress alone can remove the obstacles in the way of immigration. The earlier the people make the demand the sooner will Congress obey their will.

The policy of granting subsidies in order to encourage the establishment of ocean steamship lines to important points in foreign countries is, I believe, a good one—a necessity—in order to enable us to compete with the formidable steam marine of Great Britain. We must either do this or remain a second power upon the ocean. We find it necessary to

grant aid to great enterprises, even within our own borders. Where subsidies are granted and accepted, the Government can make all proper restrictions and regulations. Of course no one will deny that, I hope; but it ought to be done with caution and discrimination, for it would be buying the very right which already belongs to the Government and paying for it with large sums of the public money.

Just and liberal encouragement ought to be given to laudable enterprises and investments of capital. It is necessary, every one will admit, that there should be accumulations of capital. I am in favor of them; we are all in favor of them. Without them no great undertakings could be begun and executed. But we cannot favor the building up, at the expense of the people and the prosperity of the whole country, monstrous moneyed oligarchies, powerful enough to control Conventions, Legislatures and even Congress, and contaminating our whole political system. Human laws limit the interest on money—why not fix limits to the earnings of capital invested upon the highways of commerce under the express authority given to regulate commerce among the several States? In a word, the channels of commerce among the several States ought to be redeemed from the grasp of the grandest monopolies, perhaps, the world has ever seen, and be regulated with an eye single to the public welfare, before they become so potential as to virtually own the Government itself.

Agricultural, mining, manufacturing—in a word, all industrial pursuits—are so dependent upon and so intimately connected with the labor of a country, I hope to be pardoned for the allusions I am about to make.

While agriculture stands, by common consent, first in importance, because it is the true source and foundation of a nation's wealth and prosperity, all branches of human industry, each in its place, are equally important, and the whole rest upon a common foundation—labor. We are but one among many nations, and, in a degree, we have to compete with all nations. Our necessities must be supplied, and to do this we must produce and manufacture or become dependent on other nations for what we eat and what we wear. I speak of productive labor. Nothing can be done without labor. If our mountains were all gold and silver, like the fabled isles of Chryse and Argyre, they would be valueless without labor. The price in money of a day's wages is no just unit of measure as to remuneration for services performed, so far as the laborer himself is concerned. The question of greatest moment with him is as to the amount of food and clothing, and comforts and conveniences of life, to maintain himself and family, he may be able to purchase for the price of a day's labor. But the case is different with the manufacturer or producer of commodities, which have to find a market in foreign countries. In order to enable him to compete successfully he desires labor to be cheap—that is, have a low money value. But when it is dear, as in our own country, the manufacturer is continully crying out for protection—for protection to his capital. Now, labor, being the real wealth-producing element, not only of ours but of all countries, ought to be as free, untrammelled, respected and amply remunerated as circumstances will warrant. It ought to be protected, if anything should be, but without discrimination—the farmer, as much as the manufacturer, is entitled to regard as long as we deem it indispensable to resort to a protective tariff. But there is no real danger of unjust and galling discriminations if the laborers be intelligent, for they

themselves are the real rulers. Let us look, for a moment, at some interesting figures to illustrate this most significant fact.

By the census of eighteen hundred and sixty, there were in the United States, of male persons twenty years of age and upwards, eight million one hundred and nine thousand six hundred and fifty-six. There were classed as having occupations, eight million, two hundred and eighty-seven thousand and forty-eight. Now, let us endeavor to arrive at the real voting population among the productive laborers of the country. In order to do this, let us deduct all females and those who, in the common acceptation of the term, may not be said to labor, namely :

Occupation.	Number.
Barkeepers	13,263
Agents	16,478
Brokers	4,907
Grocers	40,070
Innkeepers	25,818
Merchants	123,378
Milliners	25,722
Public officers	24,693
Peddlers	16,594
Seamstresses	90,198
Teachers	110,469
United States officers	7,097
Tailors and tailoresses	33,900
Actors	1,490
Auctioneers	1,348
Bankers	2,753
Bank officers	2,995
Housekeepers	22,393
Lawyers	33,193
Music teachers	5,625
Nurses	8,132
Overseers	37,883
Physicians	54,543
Students	49,993
Traders	11,195
Planters	85,561
Unknown	62,872
Total	912,563

Among the occupations are:

Carpenters, 242,958; deduct	42,958
Farmers, 2,423,895; deduct	423,895
Farm laborers, 795,679; deduct	95,679
Common laborers, 969,301; deduct	169,301
Servants, 559,908; deduct	159,908
Total	891,741

Some of these, however, may not be worthy of the honorable occupations with which they are classed. I want these calculations to be below, rather than above the truth. Some may not actually labor; some may be only jack-knife carpenters; some who profess to be servants may be eye-servants. Hence, to be entirely on the safe side, the above liberal deductions are made. There are one hundred and sixty-four thousand six hundred and eight shoemakers, some of whom may be cobblers—let us deduct forty thousand. To make sure that we cover everything and leave the number of productive laborers—the bone and sinew and hope of the country—who are American male citizens and entitled to vote, let us make the further allowance for foreigners and all others, say one million four hundred and forty-two thousand seven hundred and thirty-nine. Total deductions, three million two hundred and eighty-seven thousand and forty-three. Balance, in round numbers, of five millions of wealth-producing citizen voters. All other voters could not possibly exceed one million. The Presidential vote of eighteen hundred and sixty, the same year of the census from which the above conclusions have been drawn, was as follows:

Candidates.	No. of votes.
Lincoln	1,857,610
Douglas	1,365,976
Breckinridge	847,953
Bell	590,631
Total	4,662,170

These figures are irresistible, and demonstrate that five sixths of the voters in the United States are the laborers—yes, the active workers on the farms, in manufactories, every place where men obey the commands of their Creator, and eat their bread in the sweat of their face. But these were omitted in making the foregoing computations: merchants, physicians, teachers, and many other useful—yes, indispensable occupations and professions, amounting in the aggregate to hundreds of thousands, a majority of whom must of necessity be in sympathy with the laboring and wealth-producing classes, and essential to their prosperity. Hence our calculations are, beyond all question, within the truth. From data found in the same census report the evidence is conclusive that

more than four fifths of the entire population of the United States are the laboring men and women and their dependent families, thereby showing the important fact that the producers are themselves the principal consumers. The same rule obtains here as well as in other States.

Who, then, I ask, are the rulers of the land? Who most interested in reasonable prices for all the necessaries and comforts of life? Who so desire to see economy in the administration of public affairs, as those who pay all the taxes and bear all the burdens?—aye, and who so responsible? Oh that the laborers and producers of all that the country can boast—of all that has made its name great among the nations—may appreciate the magnitude of their responsibility! May they always be intelligent, for in their keeping are committed the hope, the destiny, the momentous future, pregnant with coming events too grand and too brilliant, let us hope, to fade away, of this republic.

I had intended to say something in regard to silk culture and other industries, but time will not permit.

I had intended, also, Mr. President, to discuss, or at least to allude to many other topics, and among them the subject of the steam plough. I cannot doubt that ere long steam or some other convenient power will be made to perform the labor here of ploughing instead of animals. It is already used in England to great advantage. In offering premiums to encourage agriculture, our State ought not to forget the steam plough. Labor being dearer here than in any other part of the world, we must make up the disadvantages under which we struggle by adopting all the improvements in the form of labor-saving machinery. In this regard we are certainly in advance, and I believe will maintain the lead of all other nations. As long as we can do this wages will be more remunerative here than elsewhere.

Finally, Mr. President, I am most happy to believe that the Golden State has a bright future before her. No State in the sisterhood of the Union occupies geographically a more important position With many disadvantages, on account of want of population and our distance from the great markets of the world, our State has still so many other advantages and so many attractive features, that it seems amazing to those who have seen and known the facts, that the people from the Atlantic States and from the overcrowded populations of Europe do not rush here by countless thousands. The reason must be that they have not the necessary information, or the means to reach here, or both. So far as intelligence is concerned, it is only necessary to state the naked truth; but truth, in this land of wonders, of beauty and of fruitfulness, seems to the people of other lands like fiction. You must show them that the truth is the truth.

Do you think the peasant farmer of Germany, or the viniculturist laboring upon a few rods of terraced cliffs overlooking the Rhine, or any of the intelligent laboring classes in other European countries, would remain where they are were they able to reach California, and knew the real facts, the naked truth?

If they knew that wages are higher here than in any other part of the known world?

That here a common laborer can earn, over and above his own board, from four to six barrels of flour in a single month?

That bread and nearly all the necessaries of life are cheaper here than in any other country upon the globe?

That there is room for millions of people to come here and cultivate

the vine, the fig, the olive, and all the cereals and vegetables known to warm and temperate climates?

That the climate here is actually one of indescribable loveliness?

That we are blest with the "early and the latter rain," which makes California a land of almost never-failing harvest and fruitfulness?

That Winter, except in the mountains, is hardly known; no rains in Summer to blight or destroy harvests; that for six months of the year the sky bends over this land of "hills and valleys" with almost unclouded serenity?

That fruits of nearly all kinds—such as peaches, apples, pears and grapes—are so abundant as to be literally almost without price?

That while in corresponding latitudes upon the Atlantic slope of the continent, the States are buried in snow and ice, and chilled by piercing blasts from the frozen zone, here our hills and valleys and mountain slopes, refreshed and fructified by generous rains, rejoice in robes of living green.

I am greatly rejoiced to know that those who have produced this fine exhibition—manufactured these works of skill and beauty—these implements and inventions—these unrivalled products of the soil—these wares, and all the various products of manufactures—those, I say, who have produced all these, are the people who are to control and shape the future of this great country. The country is in their hands. May they appreciate the responsibility resting upon them. I believe they will. In them is all our hope, and I believe the country, Mr. President and gentlemen, is and ever will be safe in your keeping—you, gentlemen, who represent the labor and industry and all that makes our country great.

SILK CULTURE IN CALIFORNIA.

BY WILLIAM M. HAYNIE.

The rapid strides that we as a people are making in California to develop her rich and inexhaustible resources of national wealth must strike the close observer with wonder, and, if he is a true Californian, will cause his bosom to swell with true patriotic pride while contemplating the future greatness and glory of this, our noble State.

Among the many rich industries now being successfully developed in California stands most pre-eminently conspicuous in wealth and grandeur the silk culture.

In writing this essay on silk culture, as adapted to the climate and soil of California, we must be brief, and cannot enter into those deep and inexhaustible researches which the subject both invites and demands. We will, however, give in detail the experience of those who have had most eminent success in this great industry. It is admitted by them that the climatic influence upon the silkworm, while passing from the eggs to cocoons, is of a most beneficial character, from the following causes:

First—Entire exemption from explosive electricity, a severe shock of which will kill instantly large quantities, if occurring while the worms are very small. But should this occur during the last age of the worm, when they are growing very rapidly and nearly ready to finish in a natural way their brief period of existence, it would very likely destroy every worm. Electricity in all its forms is not alike destructive of animal life, but on the contrary is very essential in some of its passive forms to keep up a full supply of animal vitality, so essential for the development of active, robust animal life. Especially is this the case with the silkworms, as they have been classed by naturalists among the torpid, cold-blooded species of insects. It is admitted by scientific men of this State that we are blessed during our dry season with a full supply of this passive electricity, which gives vigor and strength to man and beast as well as silkworms, to perform more labor in the same time than in any other portion of the known world.

Second—Being entirely exempt from rain from May to November, the

mulberry leaf will mature in its greatest perfection. The mulberry, like all other herbaceous food, when subjected to an excess of moisture will secrete a watery, viscid, poisonous consistency, which, if fed to the worms, will affect them with a kind of cholera, from which but few worms will escape a premature death. But when grown in this State we have just the reverse, the mulberry maturing with just sufficient moisture to perfect it in all the elements of healthy food. We are exempt from any disease among the worms of California.

THE MULBERRY AND ITS GROWTH.

The first consideration in connection with the silk culture to insure success is a full and ample supply of the best varieties of feed, mulberry leaves. Those trees, when planted upon good moist bottom soil, are most rapid and prolific growers, making a growth the first year from the cutting, when properly cultivated, of four to eight feet in height, and the second year, after pruning the stock close off at the ground, a growth of ten to eighteen feet in height. It is very difficult to propagate the mulberry from seed, only in very small and limited quantities, from the fact that the young seedlings are very tender and easily killed by the rays of the sun, unless protected and watered very carefully for at least four to six weeks from their first appearance above the ground. It is also very difficult to get a good stand from seed, from the fact that they belong to what is classed as the two-lobed seed, and when they germinate the root strikes down and then grows up, pushing the entire seed up through the ground; the hull then falls off and the two lobes of the seed form the first two leaves of the tender seedling. They are very easily killed by frost also. Weeds, if allowed to grow among them while very young and tender, will exterminate them entirely. It is desirable, then, if we wish to succeed in raising feed rapidly, to plant cuttings.

They are planted by myself and others who are engaged in this business, in the following manner: The cuttings are cut with three eyes to each. The ground well ploughed and worked, then furrows opened three and a half feet apart. Put in the cuttings six inches apart and cover and press the dirt upon them about three inches deep. The ground is then kept free from weeds and well cultivated through the season. They are then kept pruned low, say six to eight feet, to avoid extra labor in gathering the leaves. If allowed to grow twelve or eighteen feet, it would require the pickers to pack step-ladders through the field to gather feed from the high trees. By this method of planting and cultivating we obtain the first year about eight tons of good leaves per acre. The second year the trees are all pruned or cut off close to the ground in January, and the Summer following we can pick from the same acre about sixty thousand pounds of good mulberry leaves.

The mulberry tree, when planted upon our rich bottom lands, possesses most wonderful powers of reproducing its foliage, so much so that I caused an experiment to be made on my plantation, and the result proved that in ten days after picking a portion of the leaves from a certain tree, it had grown more rapidly and contained more leaves than any other tree which had not a leaf taken from it. It must be remembered, however, that in picking, the tree must not be stripped of its foliage; leave the three crown leaves on the top and a few on the trunk of the tree. This is necessary, that the tree may have sufficient lungs left to drink in and breathe the air, and replenish itself with sufficient quantities

of nutriment, which is conveyed to the root through the leaves or lungs, to give it renewed vigor and life.

It has been well said that the mulberry will grow all over this State; but it must be remarked that upon our upland and foot-hills the mulberry would not yield so enormously without thorough irrigation throughout the season.

It is well known to all who have any knowledge of the condition of our American and Sacramento River bottom lands, that the wild morning-glory is fast taking possession of those lands, and we often hear the remark by the owners and cultivators of these lands, "I will give fifty dollars per acre to have this terrible and destructive weed exterminated." I will just say that you can exterminate it, keep your fifty dollars and make your land worth a great deal of money by planting mulberry cuttings of young rooted trees in the manner described, and then keep the morning-glory down by hoeing one year; the second year it will not trouble you much, and the third year the mulberry will take care of it and send it where it belongs, viz: out of existence. Severe overflows will kill cuttings if covered with water in the Spring for six or eight days, but when once rooted they will stand water equal to the willow. The *morus moretta* is considered the best feed for silkworms, but the *multicaulis* is grown for the first feeding, while the worms are young. It being very soft and tender, the worms thrive better on it than any other for the first three ages of their existence, after which the *morretta* or *alba* is fed to make the best quality of silk. With these remarks upon the necessity of obtaining a full supply of the best variety of feed, which are, first, *morus multicaulis*, *morus morretta* and *morus alba*, I will proceed to give the method of hatching the eggs and treatment of the worms.

The eggs are usually laid by the moths on sheets of white paper, in May, when the leaves have so far matured that they will do to feed. You take the eggs in proportion to the feed, and subject them to a heat of about eighty-five or ninety degrees, either natural or artificial. In the course of forty-eight hours, if the heat has been uniform, they will commence hatching. It is very important that every day's hatching should be kept on papers and marked separate from the following day's hatching, and so on until your eggs are all hatched. This is done in the following manner: When you perceive the eggs commence to hatch, place on them young leaves of the *multicaulis*. At night remove all the leaves from the eggs, place them on the shelves, and number the paper No. 1, or the date of the month, and the next day No. 2 or the date, and so on until all are hatched. Be very particular now, and upon no consideration should they be allowed to get mixed. It will be seen from the following remarks that this precaution should be strictly complied with.

The life of the silkworm is divided into five different ages, and in entering upon each of those ages it is to them a new life to run until again prostrated by the death-like torpid state which deprives them of all muscular power, until they shall have passed through safely its severe ordeal. This is termed the molting. At six days old the young worm will molt. Upon the seventh they recover, and will come forth with new energy and strength. About the thirteenth day from hatching they will molt again; about the nineteenth and twenty-fifth also. Upon no consideration should the worms be removed when they have commenced to molt, nor should they be disturbed in any way, not even to place food on them, for they require nothing more than simply to be let alone until you observe them coming from under the old leaves and rub-

bish, where they will retire to go through their molting, looking and begging for food by stretching their heads very high, which is a sure sign that they are hungry.

If, from any cause, they are moved or disturbed during the process of molting, it will arrest and prevent the successful performance of the process, and from which the worms so disturbed will not recover. This is in no wise a disease, and will not affect other worms who have not been so disturbed. Each succeeding molting seems to be more severe, and in the last or fourth molting great care must be taken that they be not disturbed, as any worm disturbed at this time will fail to make a cocoon. The worms, as fast as hatched, are placed upon shelves of any convenient height and breadth, in a room well ventilated and plenty of light, but so arranged as to prevent the rays of the sun from falling directly on them. The feeding for the first two or three ages is done by taking the leaves of the multicaulis and placing them very nicely over the worms as fast as they consume them. After they have passed their third molting, young twigs or branches are cut from the trees with the leaves on, and laid on the worms in the form of a triangle, and with each succeeding leaf forming triangular pyramids, through which the worms like to perambulate, and among which they will spin their cocoons when ready.

In thinning the worms from one paper or shelf to another, they must not be handled with the fingers, but lay fresh leaves on the paper that you wish to thin; when those leaves are covered with worms, take hold of the stem of the leaf and move them where you want them. Clean off the shelves in the same way.

The quantity of feed that a given number will require, say for fifty thousand worms, the first week or age, will average about fifteen pounds per day; second age about sixty pounds per day; third age about one hundred and forty pounds per day; fourth age about three hundred pounds per day. Now, allowing seven days to each age, we have, in round numbers, seven thousand eight hundred and five pounds of mulberry leaves to make fifty thousand cocoons. Twenty times this amount will be one hundred and fifty-six thousand one hundred pounds, which will make one million cocoons.

This calculation is made to apply to the Chinese silkworms, which make very large and valuable cocoons. They were imported by Prevost, the pioneer silk culturist, six or seven years ago, and to whom great credit and praise is due for his persevering energy in keeping this most valuable industry before the people of this State under so many discouragements, until we have become fully aware of its great importance to us as an industry of great commercial value. I fondly hope that Prevost, who is now well advanced in years, and in consequence of his age is deterred from engaging in the business as extensively as we who are younger, may live to see this, the crowning effort of his life, prove an eminent success. Then will his fondest hopes be realized and his soul be ready to depart in peace.

The Japanese silkworms, being of a much smaller variety, and consequently do not make so large cocoons, will not consume more than two thirds this amount of feed. It will be seen that I have allowed thirty-five days for the worms to commence spinning. This is about the usual time when not fed at night during the last two ages of their existence; but if properly treated and fed day and night during the last two ages of their lives, they will commence spinning in twenty-eight to thirty-two days from the hatching. The worms, when about to molt, will seek

obscurity from the light, when they will firmly attach themselves to the fibres of the leaves, remaining perfectly motionless, in a death-like torpid state, for twelve or eighteen hours, when they will commence to move their bodies forward, and if not disturbed will in the course of twelve or eighteen hours more extricate themselves from their old skin or coating, and leave it as firmly attached to the fibre as when fastened there by them at the commencement of the process.

It will be observed, according to my experience and calculations, that seventy-eight tons of mulberry leaves will make one million of cocoons, and that three acres of mulberries will yield ninety tons of feed. Three acres, then, will give us ample food for one million of the large Chinese cocoons. Those cocoons will weigh about one thousand four hundred pounds after being well dried and the chrysalis losing all of its animal matter and becoming a light shell within the cocoon, in which state we shall not lose over seventy per cent. in winding, which will give us four hundred and twenty pounds of raw silk. This, at seven dollars per pound, will give us two thousand nine hundred and forty dollars for two and one half acres of mulberries. Now for the expense:

Cost.	Amount.
Six men for the first age	$42 00
Eight men for the second age	56 00
Twelve men for the third age	84 00
Twenty men for the fourth age	140 00
Thirty men for the fifth age	210 00
Winding, at one dollar per pound	420 00
Total expense in full, when put in hanks of raw silk	$952 00

This leaves about two thousand dollars for two and a half acres, or eight hundred dollars net per acre. The capital to be invested to secure these results will be two and one half acres of mulberries, say five hundred dollars per acre; a cocoonery and reels, about eight thousand dollars, making ten thousand five hundred dollars. But it must be remembered that by increasing your plantation to eight acres you can make three million of cocoons in one season without any additional cost of building, by the following process: See that you have sufficient eggs for hatching this number. Place them in a tin box with perforated sides and ends; keep the box in a dry, cool place through the Winter; at the latter part of the Winter put them in an ice-house, where they will be kept at a temperature of about forty degrees. On the first of May take one million, which will be in weight twenty-five ounces, and hatch them. By the first of June these will be so far out of the way that you may hatch another twenty-five ounces, and so for July; and if you have eggs, you may hatch the fourth batch for August, which will give the nice sum of eight thousand dollars net profit on four millions of cocoons. To preserve the cocoons whole, the chrysalis must be killed. This may be done by the rays of the sun, or artificial heat. In Europe and other silk countries they are compelled to use the latter mode; but in California we usually have sufficient heat from the sun to kill them in forty-

eight hours, by exposing the cocoons to its rays. This is most decidedly the best method, thereby saving time and labor and preserving the full brilliancy and texture of the silk. After having gone through this process the cocoons are in a good state of preservation, or are ready to be reeled into hanks of raw silk. The enemies of the silkworms are rats, mice, ants, birds, bats, and in some cases cats have been known to eat them. They are very easily protected from all these enemies by care and attention while feeding. Mice will destroy them from the eggs to the cocoons. I have had no trouble with any of these pests but the mouse, and we have watched them so closely that we have not lost fifty cocoons or worms by them.

In choosing cocoons for eggs, we should be careful to choose those of the largest, but firm and hard, and of the most brilliant lustre, as it is believed and admitted by some of the most eminent silk raisers of France that we can in this way greatly improve upon any variety that we may import into this State.

After we have chosen a sufficient number of cocoons to furnish eggs for the next year's feeding, they are placed thinly upon a shelf, and in eight to ten days from the time they have finished spinning they are transformed into a chrysalis, which immediately emits from its mouth an oily substance against one end of the cocoon, and simultaneously with its head commences a shoving and pushing motion, when in a few hours it will emerge again into the world. They are then taken, male and female, and all put into a box, and as fast as they pair they are taken out and placed upon a table. In this position they are allowed to remain about six hours. They are then separated and the males put into a box. The females are placed on sheets of white paper, and in three or four hours she will lay her eggs to the number of three or four hundred. This process is gone through with every day until the millers have laid all their eggs. This will finish the existence of the silkworm for this year.

It may be asked by some what are you going to do with the cocoons or raw silk after you have made it? I will answer, we have a silk factory at San José. But you say that China and Japan are so close, and as there is no import duty on raw silk, that the manufactory will make us compete with them or the public will not buy from us. Very true. Well, then, we will raise our own silk and join together under a co-operative system and build a factory here at Sacramento. Then we will be under the protection of the manufacturing tariff, and shall be able to compete with the world in producing manufactured silk. Three or four months in the year we can be employed in producing, and the balance of the year we can pull off our coats and pitch in, under good silk weavers and foremen, and learn the art of weaving silk ourselves; and if we do not choose to do this, we can pay all of our operatives in the factory a good salary, and we will have no trouble in obtaining them. Manufactured silk is as good as gold in commerce, and my firm conviction is that in a few years Sacramento City will be the greatest depot for silk in the world. She is surrounded with the choicest mulberry soil in the world and a climate eminently adapted for silk raising, which I have proved to my satisfaction in hatching and making three different batches of cocoons during the last two seasons.

HOP CULTURE IN CALIFORNIA.

BY WILLIAM M. HAYNIE OF SACRAMENTO.

To the President and Managers of the State Agricultural Society:

GENTLEMEN: A close observer of the untiring energy displayed by the officers of the State Agricultural Society during the last three or four years for the purpose of obtaining and diffusing practical knowledge of the great industries of our noble State, allow me to say that I am much pleased with your adopting this method to effect the object sought for. What we want and what California needs to develop her capacity for producing and manufacturing nearly all the most important and valuable articles of commerce is practical knowledge from practical men, who are engaged in producing the articles to be discussed in these essays.

It may be objected to by some persons, on the plea that they cannot write an essay, through lack of education or fear of criticism by the public and the press, and therefore are deterred from giving expression and publicity to those valuable practical ideas and theories which they possess. While I admire talent and ability in all writers for the public good, I think that all persons who discharge the duties of life in a faithful manner, using as much ability and talent as they possess, are entitled to the approbation of all earnest, thinking men. I therefore have no hesitancy in writing and submitting this, my first essay, to your noble society, competing for the premium offered by you for the best essay on "Hop Culture in California," and, though possibly unsuccessful, shall feel satisfied if I have done some little good for this my adopted State.

ÇLIMATE.

California is peculiarly adapted for the cultivation and maturing of hops. It is admitted by the most celebrated and successful hop-growers of the world that the most favorable seasons for the hop crop are those when little or no rain falls, with a continual succession of south and southwest winds, accompanied with clear or cloudy skies. In seasons with alternate rains and hot sunshine days, accompanied with north or east winds, the hop is sure to fail.

In Europe and the Atlantic States the hop plant suffers more or less from casualties caused by the aphis, hop mouse, mould, blight and various other parasites that prey upon and destroy the vitality of the vines to so great an extent that they rarely ever recover sufficient to mature a full crop of hops. Indeed, such are the destructive influences of those uncongenial seasons that the success of the hop crop is in a great measure a matter of chance. Again, we who have been residents of the Eastern States or Europe know full well the destructive nature of those Summer tornadoes and thunder storms with which they are usually visited about the month of August, at which time, if it has been a favorable season so far, the hops are hanging very heavy on the poles. When such is the case those heavy winds will blow them flat to the ground and the deluge of rains which usually accompany the winds will beat and wash the lupuline from the hop to so great an extent as to make it almost worthless.

Again, if the hops have had a favorable season up to the time when the flowers are forming from the blossom, they are liable to a succession of weeks of wet or humid atmosphere, when the hop will not grow, but will remain small and dwarfish, until the season has so far advanced that they cannot mature. I have been informed by a gentleman of this city who last year was travelling through the County of Kent, England, at the time I was picking my crop the last of September, that the hops at that time in that great hop-growing country were not larger than peas, and the growers informed him that they would not mature. This was caused by a succession of wet weather for a number of weeks previous.

I have been thus particular to point out some of the most prominent causes of failure in the old hop-growing countries, not that I wish to build a reputation for California upon their defects, but simply to prove my first assertion, that this State is peculiarly adapted for the growth and maturing of the hop. I presume it would be useless for me to discuss this proposition any further, but will simply say that good hop land in California can be kept moist enough throughout the Summer by thorough cultivation. Experience is teaching me, as I gather with one hundred pickers about twenty-four hundred pounds of hops daily (after drying), that ours is a blessed climate for the hop-grower, with its warm, genial sun, succession of southwest winds and copious dews at night, free from all casualties and destroying storms, so that California is the hop garden of the world.

SOIL.

This should be a deep, rich, decayed vegetable loam, with an open porous subsoil. On such soil hops do best, but they do well when planted in light, fine sandy soil, when properly manured. Our heavy adobe soil will not do for hops, it not being adapted to thorough Summer cultivation. The first mentioned soil can be found in great quantities along our river bottoms, and should be chosen in preference to all others, because upon such soil we can harvest, after the first year, about one ton (two thousand pounds), dried hops to the acre, while our upland will yield about fifteen hundred pounds per acre.

LOCATION.

The site to be chosen for the hop yard should be well sheltered from the north winds, and if near the coast, where the south winds blow very

hard, it should be sheltered from them also. The reasons for having hop yards sheltered from heavy winds are as follows:

First—While the vine is running up the poles it is liable to have its head blown from it by the wind, and, as the hop is a rapid grower, it cannot regain its twining position around the pole without assistance, which will make it an expensive business

Second—When the hops are nearly matured they, together with the vines and foliage, are quite heavy, and a little wind will at this time cause the pole to break and fall to the ground, causing great destruction and consequent loss of crop.

PLOUGHING.

This should be done as early in the Winter as possible. With a good stout pair of horses turn the ground over about six inches deep, and if time and finances will admit let another team follow behind with a subsoil plough to loosen up the subsoil; but do not bring it to the surface. Then with a good harrow get the ground level and fine, when it will be ready to plant.

PLANTING.

Before giving the method of planting, I will discuss the subject of the sexes of the hop plant. They are male and female, and the sexual relation they hold to each other should be fully understood by the grower before planting his field. The sexes are very rarely united in the same plant, so rare that we must not make any calculation for male plants from this source. I have observed only one instance of the male and female united in the same vine in California. The male flower grows in a loose panicle, while the female flower is compact, in the shape of a cone. Hop seed produce plants; but as they are, like fruit seed, apt to "sport," cannot be depended upon; consequently, we have to procure slips or cuttings from old fields of a good variety to insure success. At the base of each scale or leaf of the female cone or flower is the germ of the seed, and as soon as these cones are vitalized by the pollen from the male plant the seed will begin to develop, and as it grows the scales and seed will begin to cover themselves with very minute balls of resinous, aromatic nature, called lupuline. This is the fine yellow flower or powder of the hop, and contains that bitter principle which makes the hop so valuable in preserving and flavoring malt liquors. When the female flower has been fully vitalized the seed will be found at the base of each petal or scale, and the cone compact and smooth and well filled with lupuline; but when not so vitalized, the petals will all be turned up and the cone ruffled and loose, without seed or lupuline, and consequently worthless.

It is a very interesting and pleasant study to walk through the hop field and see there in the vegetable kingdom the affinity of the sexes so fully developed, those female flowers in close proximity to their "lord and master," looking so beautiful, plump and fair, while their sister plants, remote from the head of the family, look withered, rough, lean and cross, simply from the fact that they were without a kind male protector while young; therefore it is highly necessary that we make ample provisions when planting for male hop vines. About one male hill to every thirty females should be planted, although some culturists say one male to fifty female hills. Your ground being in

order to plant, take three or more stakes, set them in a straight line on one side of the field, then with a steady pair of horses and a small plough get in range with the stakes, drive up to the first stake and move it just eight feet in the ploughed ground; then to the second stake, move it likewise eight feet, and so on to the end. Have your stakes all eight feet long; when you get to the last one, move it sixteen feet, parallel with the others. If you have moved all the stakes just eight feet they will be in range to open another furrow back, and continue so until you lay out the field one way, then lay it off crosswise in the same manner; now procure a quantity of small stakes and stick one in every five hills one way and ten the other, which will give you one male to fifty females, or five and six, which will give you one male to thirty females—the staked hills being for male plants. Having procured your plants, both male and female, you proceed to plant the females first. After they are planted then plant your males.

If planted in low bottom land, cover the top end of the slip even with the surface of the ground; if on upland, put them three inches under the ground. The cutting should be about six inches long, with three sets of eyes, and the larger the better for the crop the first year. Do not allow the cutting to be exposed to the sun. If not ready to plant when you get them, they must be covered three or four inches with moist earth. Put two female and two male plants in their respective hills. This finishes the planting.

POLING AND TRAINING.

The hop field should always be located convenient for getting poles, as they are an item of great expense in hop raising. Cut the poles about eighteen feet or longer, if possible. Sharpen them at the large end with a regular taper of about ten or twelve inches; haul them into the field as soon as possible after planting, so that they may be set before the sets begin to send out their small fibrous roots. With a crowbar make a hole on the south side of the hill, then insert the pole and press the dirt firmly around it with the foot. As soon as the young vines are long enough to pass once around the pole you must commence training them to the poles. The poles being on the south side of the hills, you will take the vines very carefully in the hand and pass them around the east side to south, then to the west—or, in other words, with the course of the sun, from east to west. If they are placed round the pole the opposite way they will not run up it. After placing the vines round the pole most hop growers tie them with soft twine or yarn, just below the second joint from the end. My plan is to cut a sliver from the bark of the pole and place them loosely in the slit, when they will cleave to the pole very readily, and save the time and expense of going around the second time to untie the twine. The vines must be watched very carefully until they get well up the poles very near the top. If they are permitted to leave the poles by the wind, and not put back very soon, they will grow from the poles and be broken or worried so much that they will not bear hops.

CULTIVATION.

This must be done in a thorough, systematic manner, with energy and perseverance, for it must be remembered that land suitable for hop culture is admirably adapted for the growth of weeds; and should the

weeds get the preponderance of growth in their favor, and be allowed to retain it, they most assuredly will blight the hopes of the grower in harvesting a crop of hops. It is necessary, then, to commence cultivation as soon as the weeds begin to grow. The soil should be kept mellow and fine to the depth of four or five inches, and how to effect this depends very much on the knowledge the grower has of farming implements. My system is to plough twice, both ways; first from the hills, second to the hills, and hoe the hills as often as is required to keep the weeds from growing. The hop field should not be ploughed while in blossom (in July), as the horse or man, coming in contact with the vines, will cause the blossoms to fall off. If necessary, they may be ploughed after the hop flowers are set, which will finish the cultivation.

PICKING.

The hops are ripe and ready to pick generally about the twenty-fifth of August. When ripe they turn from their dark green color to a light yellow or primrose color; the seed will become quite hard and tinged with a beautiful purple edging around it. Usually in large hop fields it is best to commence picking at least ten days before the hops are fully ripe, as it is most likely that the last of the picking will be far too ripe, and the seeds and lupuline will shell out very freely, and cause a great loss in the weight and value of the hops. The picking in California is done altogether by Indians and Chinese. The price paid for picking is one dollar per day for each man, and they board themselves. The picking is done by placing boxes in the field, and four men at each box. One man then cuts the vines three or four feet from the ground, pulls up the pole and conveys it to the pickers. When the boxes are full the hops are put into sacks, which are carried to the hop-house by the pickers.

Too much care cannot be exercised in picking hops, as all that are wilted or black should be discarded. Great care should also be taken to have them picked clean and free from stems and leaves. The picking cannot be done much in advance of the drying. All that are picked in the forenoon should be carried to the kiln at noon and dried, and the afternoon's picking at six o'clock for the same purpose. This is by the old method of drying, where they can only dry two kilns full in twenty-four hours—it requiring twelve hours for each kiln.

My patent kiln process allows me to dry three kilns per twenty-four hours when we first commence, and the hops are quite green, and four kilns full in the same time when the hops are fully matured. Hops should not remain in the sacks over six or eight hours after they are picked, as they are very liable to sweat and heat and turn black when dried, which will spoil the sale of all that may get mixed with them.

DRYING

This process is one of the most difficult and hazardous the grower has to perform, arising from the fact that the kiln has to be watched night and day by a careful, watchful and competent person—and when we have to rely upon hired help to assist in this department, we very often find them at night fast asleep and the fires nearly out, which will do the hops much injury.

I will now describe the old kiln and the process of drying by it. The kiln is usually built in proportion to the size of the hop field. The kiln

for the fires, the room over the kiln for drying, and the press-room with the cooling room over it, are usually built under one roof. For a field of twenty acres of good hops a building forty-six feet long by thirty-six feet wide, and eighteen feet in height, will be required. This building is divided into four apartments. First, by running a partition through the building crossways; twenty feet from one end we have two rooms, the one twenty by thirty-six feet, the other twenty-six by thirty-six. We now take the room twenty by thirty-six and convert it into the kiln below and drying room over it, by placing, fourteen feet from the ground, joist thirty-six feet in length, two by six, two and a half feet apart; upon these joist are placed strips, one by one and a quarter inch, on edge, and nailed about three inches distance apart; upon this is placed a cloth of very open texture, or meshes nailed around, just as we nail our carpets on floors. The kiln below is large enough for two large stoves, and the room over head is where the hops are spread out to dry.

We now lay a floor ten feet from the ground in the room, twenty-six by thirty-six, which gives the baling room below and cooling room over it. At the end of the room which constitutes the kiln and drying room we build a large platform, and an easy stairway for the pickers to ascend with the hops in sacks and place them thereon; a door is cut through the wall from the platform into the drying room, through which the hops are taken and placed upon the drying floor; a door two and half feet wide, hung perpendicular, is cut through the whole length of the partition; the door, shutting even with the drying floor, will admit the hops, when dry, to be shoveled and swept from the dry room into the cooling room or floor, which is four feet lower. The press is placed under this floor, about fifteen feet from the kiln, and a scuttle or door is cut in the floor to convey the hops, when cool, into the press. The old style of press is a screw press, with four upright posts, and the box set up inside of the posts and pinned together firmly; the box is then filled by letting in the hops, while two men tramp them in until full, when the screws are put on and the bale pressed to a proper size. Cloth of heavy material is put under and over the hops and sewed around the bale. Two doors are cut in the partition that divides the kiln from the press room, one abreast of each stove in the kiln, so that wood may be placed in the stove through these doors while standing in the press room, or, as that part is generally called, wood room. The wall of the kiln and drying room should be lathed and plastered, and at the base of kiln should be sufficient ventilators cut all round, and a large ventilator on the roof of the drying room to allow the free passage of hot air through the hops while drying.

Having thus described the kiln now in common use, I will give in detail the process of drying. The hops are taken from the platform and carried into the drying room, and great care must be taken to spread them uniform in depth all over the drying floor. Neither should the hops lay more compactly in one place than another. If great care is not taken in this operation, the hops will not dry even and uniform, but where the hops are the thickest or most compact they will require much more time than the loose, low places. As soon as the hops are placed in the drying room the fires are started in the kiln, the ventilators all opened and a uniform current of hot air kept passing through them—if put on twelve or fourteen inches deep—for twelve hours. As soon as the top hops will rattle when stirred they should be turned over to insure thorough drying. This process is done by two or more men entering the drying room with wooden shovels, and, commencing at one side of

the room, they will turn them as carefully as possible; otherwise, the bottom hops, being very brittle, the least touch will cause them to fall to pieces, and the seed and lupuline will separate from the cones and sift through the cloth into the fire room and be lost. The hops are dry when the greater portion of them will break when bent, and also when the vapor ceases to rise from the hops they are about ready to be discharged from the kiln. This is done by men entering the drying room and with shovels and brooms sending them through the door opening into the cooling room on the cooling floor.

This process also needs great care, as before the hops are all out, they being hot and brittle, will be entirely broken up and the greater portion of lupuline and seed will be lost. As soon as the kiln is discharged, you will fill up again with fresh hops. The dried hops should remain where they are until cool, when they are shoveled back to make room for the next lot, and so on until the harvest is over. After two or three days drying, the first dried will be in condition to bale. Having dried our crop by this process last year, I was advised of the great loss of lupuline and seed and consequent loss of value of the hops.

It will be remembered that I have stated under the head of planting that the value of the hops consists in the lupuline and seed which they contain, and the more uniformly the lupuline is distributed throughout the bale the greater the value of the hops, for the following reasons: When the hops are used by the brewers they are compelled to use with each brewing of so many gallons a certain number of pounds of hops, and if part of the bale contains an excess of lupuline and seed, their beer is too bitter, and if they should get all leaves, the reverse will be the case, which in either case makes very bad lager beer.

It will be seen, then, that to cure and bale hops in the best possible manner is the greatest consideration of the hop grower, and to effect this I have invented and patented an improved hop kiln and drying process, which entirely removes all the difficulties of the old process. As I am now using it, a model, with a bale of hops dried by my process, is on exhibition in this hall. The kiln or fire-room is the same as the old process. What I claim as my invention is, in place of slats and cloth for the drying-room, I have longitudinal boxes made with the two sides and ends solid. At each end there is bolted on firmly an iron handle, with a swivel eye-hole projecting through the handle and end of the box, directly in the centre. The tops and bottoms of the boxes are the same. Grooves of an inch in depth are made on the inside. The bottoms consist of wooden frames, with wire cloth covering them. Those frames are inserted into the bottoms of the boxes. The boxes are then filled with hops outside of the drying room. The boxes are then run into the kiln over the fires on a railroad track. I have one extra cover.

When the hops are ready to turn we commence at one end and insert the extra cover in the grooves at the top of the box in the kiln. The box is then drawn out of the kiln and suspended by means of two hooks hanging from overhead at an equal distance with the height of the box. The box now hangs on a pivot, and is turned very smoothly and quick. It is immediately replaced, and the cover on top is now withdrawn and placed in the next box, and so on until all are turned, without breaking a single hop or loss of lupuline. When fully dried and ready to be removed from the kiln, the boxes are run out upon a pair of truck wheels with long bearings and removed to the furthest end of the cooling-room, where a small pulley is attached to each single eyebolt in the end of the

box and the box emptied of its contents just where we want it to lie until ready to bale, when in two days the hops will have absorbed moisture enough to toughen them so much that in baling we get them all in whole, with the lupuline and seed remaining as they grew in the field.

My kiln consists of eleven boxes fourteen feet in length, three feet wide and twenty-two inches deep, in which I dry every twenty-four hours three batches, amounting to about twenty-four hundred pounds of dry hops. A kiln of the same dimensions on the old plan cannot dry more than one thousand pounds in the same time. My process entirely obviates the necessity of any one entering the drying-room over the hot fire for any purpose, which is very unhealthy and disagreeable work. The press that I have in use is of my own construction and is so arranged that the box is ten feet deep, which, when filled up with hops lightly pressed down with a board, makes bales of the usual size weighing two hundred and fifty pounds.

ROOT PRUNING.

After the crop has been harvested and the poles removed from the field, the hills are trimmed of all old vines, which are gathered and burned. After the first heavy frost the whole field has to be pruned under the ground at a depth of three or four inches. The crowns will send out a great many runners, which have to be removed every Winter. This is done by running a plough close to the hills one way, heaving the dirt from the hill; then, with a three-tined hoe, remove the dirt from the crown of the plant, hook up all those runners and cut them close to the main crown. Cut also a small piece from the top of the crown and cover up the hill with fine dirt, and then get ready for poling, cultivation and work in the Spring.

SILK MANUFACTURE.

BY JOSEPH NEUMANN.

The culture and manufacture of silk has ever been one of the greatest and most prolific branches of industry on our globe. Since the time that the wise Empress Si-Ling-Chi, of China, conceived the idea of taking the precious silkworm into her parlor and bestowing particular care upon it, this business has been increasing and improving. It has steadily kept on spreading to Persia, Turkey, Italy, France, Germany, England, and over the Atlantic to the United States of America. In its turn it has reached California, and in order to prove that it will be as profitable here as in any other part of the world, and in reference to the establishment of a silk factory in California, with which a fair commencement has been already made, I beg leave, through the favor of your society, to lay this essay before the public. It has been said that our enterprise is premature; that we are ten years ahead of our time. Such assertions may be uttered by those whose interests are opposed to home manufacture, or by that class contented with things as they are; to such I say that a silk factory ought to have been established three or four years ago, and I hope to prove my assertion by the following statement of facts, to which I crave the careful attention of all Californians:

First—A silk factory in California will have an indisputable and important advantage over those of the Eastern States and Europe, in consequence of our being so near to China and Japan, and having a direct steamship communication with those countries, so that we can import our raw material at less cost and in less time.

Second—The culture of silk in this State has advanced to such an extent that California bids fair to rival the silk-growing countries of the Old World. We have about four hundred mulberry plantations now, which will be trebled next year, and in a few years we can expect to have sufficient raw material for our own manufactures, with a surplus for exportation.

Third—There is no import duty whatever on raw silk, and as the Eastern as well as the European manufacturers have to pay the same price for it as we have, our advantage over them is evident. We can

turn the raw material into a fabric before it reaches those more distant markets.

Fourth—A great deal has been said about labor. One question was: "Can we obtain operatives here?" It is ascertained beyond doubt, that for the next twelve months we shall have more labor offering than we shall be able to employ. By the last two or three steamers several practical hands arrived and made application for work. They had heard and read in our papers that a silk factory had been started here, and on this account had emigrated to California. As soon as it becomes known that work in that particular branch of manufacture can be obtained here, workmen will flock to our shores by hundreds.

The next question is about the high price of labor. Concerning wages in Eastern factories we are on an equal footing with them, since good mechanics are as well paid there as here. The work to be done in the spinning department is generally performed by children, who are easily taught; and we have enough young ones in California whose parents will be glad to have them employed in so useful a manner. But some doubts have been expressed about our ability of competing with European labor. It is certainly true that the price of labor in Europe is far below ours. Nevertheless, our advantages more than counterbalance this drawback. For example: a silk weaver in Europe earns five dollars a week (this kind of work is everywhere paid for by the yard); but should he earn fifteen dollars here, we should still be able to sell below the imported prices and make a handsome profit. The calculation is as follows: One yard of silken dress goods, weighing three ounces, of which a man can make six yards a day, more or less, according to the character of the silk or the skill of the workman, costs the European manufacturer after finish ready for market, two dollars and fifteen cents, calculating fifteen cents a yard for wages. By trebling these wages, it will cost us here two dollars and forty-five cents. For a yard of silk of this quality our importers have to pay in Europe two dollars and fifty cents. To this, sixty per cent. import duty, and fifteen cents for freight, insurance and exchange, together seventy-five per cent., or one dollar and eighty-seven and a half cents, are to be added, which brings the cost price in San Francisco as high as four dollars and thirty-seven and a half cents. Thus it will be readily seen that we can sell such fabrics much cheaper, leaving a large margin for profit. The same proportion applies to articles of higher or lower qualities and value.

Fifth—Sewing silk, embroidery silk, tram and organzine silk. These descriptions of silk are to be considered as an important branch of the manufacturing business, and the Pioneer Silk Factory has already a complete set of machinery with which to prepare all varieties of these silk goods. The following statement will convince the reader that no doubt can exist as to the profit to be derived:

Sewing silks, in skeins, are selling in this market from seven to sixteen dollars per pound. Sewing silks on bobbins or spools, such as for tailors, shoemakers, saddlers, or for use in sewing machines, sell for from fourteen to eighteen dollars per pound. Tram and organzine are only for weavers and trimming manufactories. The prices of these range from fourteen to twenty-four dollars, according to quality and color. Embroidery silks are from ten to thirteen dollars in price here. The above named articles are hardly at all imported from Europe, being chiefly manufactured in the Eastern States exclusively by women and children. The wages of the latter range from four to twelve dollars a week, and I am aware that we can have even cheaper hands here. As the raw material can be

laid down here from four dollars and fifty cents to nine dollars per pound, the public may form an opinion as to the profits of the manufacturer.

It is well known that whoever has started this industrial enterprise, no matter in what part of the world, has always succeeded in making an independent fortune. Such, for instance, as the silk factory in Brandenburg (Prussia), where I first learned weaving, belonging to the firm of Jacob & Abraham Meyer. It was commenced in eighteen hundred and twenty-six, with a capital of, at most, six thousand thalers. This factory, when I left it in eighteen hundred and fifty-four, employed more than one thousand hands in weaving, winding soft silk and making spools for filling. It produced from four hundred to five hundred pieces of all kinds of dress goods monthly, some pieces of a length of eighty or ninety yards. Their principal place of business is now in Berlin, where they employ about two thousand hands more, in small groups from six to fifty hands, to whom they pay higher wages on account of the factories belonging to masters of shall means. The factory is now in the hands of the children and grandchildren of the first founder, and their fortune is estimated to be from six million to eight million dollars—certainly a handsome increase since eighteen hundred and twenty-six, in spite of their heavy annual losses. The establishment of silk factories in Prussia was already a favorite scheme of Frederick the Great, and he had mulberry trees planted as early as seventeen hundred and sixty-three. Now the business is highly prosperous not only in Berlin and adjacent towns, where from fifty thousand to sixty thousand hands are employed, but also in Crefeld, Elberfeld and other parts of the kingdom.

In Switzerland the silk manufacturing business is flourishing, and ranks next to France.

The City of Vienna also has factories, in which five thousand hands are employed.

There is also a large factory in Pesth (Hungary), in a thriving condition.

Italy was the first country on the European continent where silk culture and its manufacture was introduced, and in Piedmont there is hardly a town or village which does not produce something of this article.

Let us glance at France. Is there any branch of industry which has added more to the glory and wealth of that country than the silk manufacturing business? There is not; and this being so well known everywhere, I need not say more about it.

In regard to silk manufacturing in England, it is also notorious that at Manchester, Macclesfield, Derby, etc., thousands and thousands of hands are employed in it. Lombe, of Derby, in seventeen hundred and sixteen, disguised himself as a workman, went to Piedmont and succeeded in taking drawings of the machinery for making organzine, which article, up to that time, was always imported into England.

There are silk factories in St. Petersburg, Warsaw, Capital of Poland, and other places—too many to enumerate them here; but it will be seen from the above that there is hardly a country on the European continent where this business does not exist.

Now, let us look into the present condition of the silk manufacturing business of the United States. We can estimate at a low rate that between fifty and eighty thousand hands are employed in it. Take, for instance, the factories in Paterson, New Jersey. First, Thomas Dale & Co. This factory was finished, but the machinery not quite in operation

when I visited it last year. I estimate that it contains about two hundred thousand dollars worth of machinery. It is a brick structure of four stories high. The firm must give employment at this time to from six hundred to one thousand hands. The next in importance are Hammel & Booth, employing also several hundred people; Rile & Son, Abraham Tilt & Son, and four or five others. Besides these, there was a silk velvet association, incorporated about two years ago, with a capital of five hundred thousand dollars. Their principal place of business is New York.

There are large factories in Connecticticut and Massachusetts. In Philadelphia we especially have to mention the factory of Hausmann & Son. It is managed on a large scale. There are also the works of Tom Harrop, John Smith, and several others.

All these above named factories manufacture solely sewing silk, embroidery silks, tram and organzine, and are very little connected with weaving. There are some factories in the City of New York, as well as in Connecticut, the principal business of which is weaving. But we shall combine all of these separate branches of weaving, spinning and dyeing in California.

None of those factories in the Eastern States have such facilities offered to them as we have in our State. First, there is the steamship communication with China and Japan, by which we can get the raw material cheaper and quicker than any other manufacturer on the globe; and second, the culture of the silkworm, which has advanced to such an extent that within a few years we shall have enough of our own raw material.

The reader will see that everything said above is based upon facts, and that in any emergency we are able to manufacture silk goods considerably cheaper than they can be imported either from the Eastern States or Europe; and I am convinced that no better chance for investment was ever offered to the public than this silk manufacturing business.

RESOURCES OF CALIFORNIA,

AND THE BEST MEANS FOR THEIR DEVELOPMENT

A POETICAL ESSAY, BY MRS. M. A. HALL, OF CALAVERAS.

Again, the year's appointed day we greet,
When here, from far and near, the many meet,
Who, with full hand and aims united, come
To grace the hour and share our harvest home.

Let us together view the rich display,
Rejoice together on this festal day;
Together, in our hearts united, bless
The hand that crowns our labors with success.

Come, let us view the tribute of the field,
See what our gardens, what our vineyards yield—
Survey our herds and dairies' bounteous store,
And choice abundance of the precious ore.
Returns of insect labor, even, us assure
Our State in their resources is not poor.
The costly fleece, a native of Cashmere,
Our genial clime as fine and good can rear;
Our southern border grows, as strong and free
As if indigenous, the olive tree;
Like California, where, out from the earth,
Are brought by men such varied products forth?
And more, unnoticed, wait their fostering care
To swell the number far beyond compare;
Our granary well nigh the world might feed,
And luxury here might satiate his need.

But to what purpose do we congratulate?
Only to boast the riches of our State?
Should we not rather counsel how we best
May make each interest support the rest?
Nor let a golden glamour blind our eyes

To that wherein a State's true vantage lies.
For oft in vain and partial is our toil;
We mine beneath, not cultivate the soil;
Into this one and most uncertain groove
The State's whole capital is made to move,
And to our only great commercial mart
Is drained prosperity from every other part;
For every mountain, every inland town,
With mining stock inevitably goes down.
Let us survey our mining country through—
The landscape give a retrospective view—
The present scenes with those gone by contrast;
How dim the picture, by the vivid past!
See ruin claim what patient labor gained;
See want sit king where millions were obtained;
See silent quartz mills, and abandoned lodes,
Forsaken hamlets and neglected roads.
No sign of thriftiness the prospect cheers,
But desolation everywhere appears,
Save here and there a cabin's lonely den,
The wretched shelter for more wretched men,
Or whisky shop beside the road obtrudes—
A blot polluting on the solitudes.

O, what the picture shall illume again?
What shall reanimate this dead domain?
Hallow the ground, and make the meanest rill,
Hill, vale and grove a feast of fatness fill.

O, men of capital, on you we call;
Are there no patriots among you all,
Who this one-sided policy will spurn,
And backward now the golden current turn?
Build railroads, dig canals, and irrigate,
Throughout its length and breadth, our fertile State;
Set up the spindle, speed the busy loom?
For every labor, helpful hands will come;
The men of might who mechanism command
Shall stations find, and honor in the land;
Art's subtle powers shall then to us descend,
And grace and beauty with the useful blend;
Cities and towns, like magic, will uprise,
And fields of plenty shall salute our eyes.
Our lowlands drained, a scourge shall be no more;
Our river channels dredged from shore to shore
Contain our floods, not they our terror be,
But white with commerce hast'ning to the sea.

When you all this, and more than this have done,
Your work of duty only is begun;
No country prospers governed by misrule,
Or grows to greatness without church and school.
And legislators should be taught to deal
With private interest less than public weal;
Nor means of evil men provide,
That their own vicious wants may be supplied;
Not whisky, cards or billiard tables can

Advance the good or happiness of man;
Wisely the Sabbath was ordained of heaven,
A rest from labor one day out of seven;
Be this remembered—let it sacred be—
A pledge, God-given, for man's prosperity.
Let them whose talents yearly thousands gain,
If their professions be not all in vain,
If to pre-eminence they have a claim,
And labor not alone for wealth or fame,
Sometimes the pathway tread the Master trod,
And guide the poor man in the way to God;
Leaving the city and its shows behind,
Their luxury and ease alike resigned,
Counting their time and efforts both well spent
If they the general good may thus augment.
For homes of happiness, if such be gained
By means like these, are builded and sustained,
Wherein the men of eminence have birth,
Who form the strength and glory of the earth;
By such our future prove, whate'er the cost,
In heaven's just balance weighed—it is not lost,
But will our golden State give purer fame,
And make her greatness far exceed her name.

SYNOPSIS OF A LECTURE

ON

EUROPEAN AGRICULTURE,

BY. W. WADSWORTH,

DELIVERED BEFORE THE STATE AGRICULTURAL SOCIETY.

EUROPEAN AGRICULTURE.

SYNOPSIS OF A LECTURE DELIVERED BEFORE THE STATE AGRICULTURAL SOCIETY, JAN. 31, 1868,

BY W. WADSWORTH.

FENCES.

One of the first things that strikes the American as a novelty as he enters France, is the entire absence of fences. Go where you will all over France, Belgium, Holland, along the Rhine into Germany and over into Northern Italy, and there are no inclosures, no fences around the common farm lands, nor is there need of any.

It would require twenty milllions of dollars to fence in France as the New England States are fenced, and then half a million dollars annually would not keep those fences in repair. It would cost ten millions of dollars to fence in the two great Valleys of the Sacramento and San Joaquin and the Tulare Plains, and another million would hardly fence in the smaller valleys running up into and among the mountains and foothills, and then half a million of dollars would not keep those fences in repair against fire and flood—and the people of California ought to learn to save themselves this vast expense.

It would be one of the greatest incentives to an increased immigration if peoples of other countries knew that on arriving here they would not have to expend half they possess in fencing in their land as against their trespassing neighbor. It is true that in some parts of the old countries of Europe there are inclosures, but they are always because some one wishes to fence something in—as deer or other animals. It is the law there that they shall do so, and it ought to be the law here.

GRAIN FIELDS.

The larger part of all the arable land of France, Belgium, Holland, Prussia and Italy is devoted to grain fields, not because they yield better returns than though occupied by some other crops, but because the people must be fed.

There is nothing peculiar in their mode of cultivation of their grain fields as differing from our own, but there is a marked contrast between those of France and Germany and those of England; for whilst in England they often manure at the rate of twenty cartloads of barnyard manure to the acre and get from thirty to forty bushels of wheat to the acre, in France they will use but ten bushels to the acre of concentrated manures, as the phosphate of lime or magnesian limestone, and yet obtain the same number of bushels of grain to the acre—the former ploughing six or eight inches deep, the French only four or five inches.

VINEYARDS.

On entering France at Havre, we see but few vineyards till we approach Paris. There are more as we leave Paris in a northeast direction toward Belgium, but all of these appear to the eye of an American or Californian more like nurseries of vines than vineyards twenty or fifty years old. The vines appear stinted in their growth, as compared with our own, and this feature prevails all over Europe, as is shown by the close planting pursued, vines being grown on an average about four feet between rows, and from two and a half to three feet apart in the row. We cannot adopt their mode of planting or pruning; the rank growth of our vines will not admit of it. There is one fact connected with the altitude at which vines are grown deserving of special notice by Californians; it is, that throughout all the hill country of the Rhine and the mountains of Switzerland, the greater the altitude at which vines can be grown and barely perfect the ripening of the grape, there is found the wine of the richest flavor and "bouquet," showing that as yet we have hardly a conception of the immense extent of mountain and foot-hill lands that may profitably be devoted to vineyards that must attain the highest character for fine wines of any in the State.

There is an altitude, however, to which the vine is limited in its production of wine without the addition of sugar. Along the Alps and Appenines, two thousand three or four hundred feet above the level of the sea, is the extreme limit, so that we should bear this in mind before going largely into vineyard culture at a greater altitude than this in our State without previous experiment.

At the Grand Exposition the California wines of the following brands, viz: Kohler & Frohling, M. Keller, Sainsevain Brothers, C. Le Franc and those of the Vinicultural Society of Sonoma, were far in advance of the Atlantic States wines, and a Committee chosen to test the character of American wines gave it as their opinion that the California wines were none other than European wines that by accident had found their way into American bottles with California labels. The Committee, however, on being corrected in their mistake, acknowledged the superiority of the California wines.

Our people, however, are making a mistake so long as they continue trying to imitate foreign brands. California wines must finally attain a character peculiarly their own, and the sooner this is done, by allowing the wine of each and every locality to show its legitimate character without "doctoring," the better will it be for us in putting our wines in the markets of the world.

In regard to the profits of the wine culture, as compared with that of grain, it stands thus: that whilst thirty bushels of grain to the acre, at two dollars per bushel, amounts to only sixty dollars, the acre of grapes will yield from two hundred and fifty to five hundred dollars in wine;

and this is just the reason why France at this moment wants wheat to feed her people. Owners of lands consult their own pecuniary interests there, as here, and as long as the vineyard acre pays two or three times greater profit than the grain acre, vineyards will continue to take the place of grain fields, though they may have to send abroad for their bread.

SILK CULTURE.

The third great agricultural interest of France is undoubtedly silk culture and manufactures. The green and shining leaf of the mulberry is to be seen on every hand. Wherever we go, and in all that portion of France devoted to silk culture as an annual product, yielding a large revenue, every house, almost, outside the cities, is for forty days every year a cocoonery. Nearly the same can be said of Southern Germany, Switzerland and Northern Italy; and the profits are immense wherever the business is pursued under favorable circumstances.

Lombardy, Italy, which has an area of only six thousand square miles—California having one hundred and fifty-five thousand—though one third of all the arable land is annually in grain, exports annually fifteen million dollars worth of raw silk. But it is in the middle and south of France where we find the silk business the most prominent of agricultural interests, next to wine.

The City of Lyons, three hundred and fourteen miles south of Paris and two hundred and eighteen north of Marseilles, is the great silk mart of the world. With a population of two hundred and ninety thousand, of this number one hundred and ten thousand, or more than one third of the whole, are engaged in some way in silk manufacture. Of this number only one thousand three hundred are women, and about four hundred or five hundred children. There are over sixty thousand silk weavers. There are nearly six hundred silk merchants; these buy the raw silk from all parts of the world, and give it out with the patterns to master weavers, who generally have from three to eight looms in their dwellings, and employ weavers to execute the work. There is not a single large silk factory, such as we would term a factory, in all France.

In Lyons alone they use up about six million pounds of raw silk, valued before working at about thirty-six million dollars.

In regard to the profits of silk culture there are no two opinions. In France, Italy and most of Southern Europe there has been a disease of the silkworms that has baffled the science of the whole world to provide a remedy, and which causes an annual loss of nearly fifty per cent., and oftentimes more, of all their worms before making their cocoons; and yet, with this great loss, the business pays better when properly and scientifically conducted than even grain or grapes.

The following figures can be relied upon as a basis of calculation: A mulberry tree ten or fifteen years old can spare annually, without injury, one hundred pounds of leaves; the worms fed upon these leaves will produce one and a half pounds of silk, worth six dollars per pound; but calling it only five dollars as the annual profit from each one hundred pounds of leaves, and with only one tree on every square rod, it gives as the product per acre eight hundred dollars, in raw silk.

All over Europe it rains, as in the Atlantic States of our country, at any and all seasons of the year, and these rains are often accompanied by thunder and lightning; both the rains and the electrical discharges are to a great extent fatal to the silkworm. In California we are

exempt from both during the whole season of feeding, even if prolonged through the whole Summer. This gives us one of the finest climates, if not the very best, for the rearing of the silkworm, and no country can grow better trees or a better quality of leaves.

The difference between the production of one or two hundred dollars worth of wine or silk by the small farmers and families of our State would be this: that whilst the wine would be very likely to be consumed by the family and friends who might call during the year, the silk that that same family could produce in forty days from the hatching of the eggs, in value quite equal to the wine crop and at less cost, would be just so much money in bank.

I found the mulberry cultivated in every way and form that trees are made to grow—sometimes in hedges, the trees set ten or twelve inches apart; and the *morus alba* in this way makes a strong compact hedge. Single trees of large size and orchards of considerable extent are common all over the south of France; but to obtain the most leaves at once from an acre of ground and with the most profit, they should be set in rows not to exceed four feet apart, and two feet apart in the row. This permits of thinning out from year to year until the plantation assumes the character of an orchard covering all the ground, and which has been its peculiarity from the first.

BEET SUGAR.

Since the time of the first Napoleon, who offered one million of francs to the person who would discover the best method of obtaining sugar from a native product, beet sugar has been an important agricultural production of France. Its manufacture is steadily increasing, and there are now over four hundred beet sugar factories in France alone, besides a large number in Germany. And the manufacture has extended into Russia and Hungary—in fact, all through Central Europe. There is nothing peculiar in the cultivation of the beet fitting it for sugar making, or in soils producing it; but wherever it is grown the best soils are those inclining to a rich, light loam, and the best season for the development of its saccharine qualities in the highest perfection, a warm and dry one.

I have no hesitancy in hazarding an opinion that California has a climate for the production of sugar beets excelled by none other. As to the profits arising from their culture, this depends, of course, upon the demand for sugar making, and the price they will bear in the market for that purpose. In Europe the product is on an average per acre of about ten tons, whilst in California it is not unusual to hear of thirty and even fifty tons of common beets to an acre. Judging by every fair comparison that can be instituted before actual test, I believe California can grow her own sugar from the beet and compete with cane sugar imported under present duties.

HOPS.

Immense quantities of hops are grown all over Europe where suitable soil is found for their production. Their culture there hardly differs from our own, except that instead of training them low, as with us, they are allowed to run to the tops of the poles, twenty-five and thirty feet high, and usually set in rows about four feet apart and the same distance in the row. At the Paris Exposition nearly every country in Europe had its porter and pale ales on exhibition; and though beer may be considered as almost the national drink, especially of England and

Germany, yet Smith Brothers, of New York, carried off the highest premium offered for the best porter and pale ales. It surprised the English brewers and astonished those of Germany, and when they inquired of the person in charge of Smith Brothers' ales and beers, how and of what they managed to make such liquors of, his reply was, "Croton water, with California hops and barley." So that really California is entitled to nearly the full credit of the best ales at the Paris Exposition.

A small bale of hops from Sacramento, California, on exhibition there, were the best from any country and secured the admiration of European brewers over all others.

I find it desirable, if hops are put up for a European market, that they be made of three qualities: the large strong hop, a second quality of medium size and strength, and a third grown upon higher and lighter land, possessing a softer, finer flavor. California hops have already a world-wide reputation.

THE POPPY.

There are hundreds of acres of poppies grown in France alone. They are sown broadcast the same as oats, in early Spring, and yield a crop of seeds, for which purpose alone they are raised, of the value of two hundred and fifty dollars an acre, in good seasons. They are grown solely for the oil contained in their seeds, which is expressed and used for any purpose for which the best olive oil is used.

WATERMELON SUGAR.

In Lombardy, Italy, large fields of watermelons are raised solely for making sugar. They are cultivated upon the sandy borders of rivers after the Spring floods retire to within the banks proper of the streams. It is just so much land put to a good purpose that in almost any other country would be thought of no account for cultivation. The vines are grown in rows eight feet apart and only one foot in the row; and when they have reached a height of six inches and are just ready to lop over for running, a light furrow is turned against them by a hand plough, which a man pushes before him, and all the vines are turned over one way, which way only they are allowed to run. Only two melons are allowed to grow upon each vine; all others are carefully pinched off, so that there are no unripe, half-grown ones. To make them into sugar a man takes one at a time, and with a large knife, upon a table a little inclined to one side, with a single blow, divides the melon in two parts; then scoops out the soft and sweet portion with a wooden scoop or spoon; that passes off the table upon a fine wire sieve placed over a tub for receiving the juice. The juice is at once set to boiling, and after a skimming process, once or twice repeated, is, with the greatest ease, concentrated into a very fair, yellow-looking sugar.

THE LOMBARDY DAIRIES.

In no part of the world that I have seen are there better managed or more productive dairies than in Lombardy, Northern Italy. The cows are kept up all the year round, and all the year fed with green food, clovers, grasses and watermelon rinds. And in that little State of Lombardy, no larger than two of our mountain counties and very greatly

resembling them in their physical formation of mountain, hill and valley, there is annually produced, for exportation, from fifty million to fifty-five million pounds of cheese, worth, before removal, from seven to eight cents per pound, or more than four millions of dollars; and yet one third of all the arable land in Lombardy is in corn and grain. To a very great extent throughout all the lower and level portions the land is divided up into very small farms, generally not exceeding from five to eight acres, and each of these farms supporting a family of from five to nine persons. It is the most densely populated of any country in Europe, and yet seems to enjoy more of the comforts of life than most of their neighbors to the north and east of the Alps.

THE LEVEES OF PIEDMONT AND LOMBARDY.

Situated as these States of Italy are, at the base of the Alps, with almost numberless mountain streams and torrents, tributaries of the Po, coursing through and giving fertility to all the lower valleys and plains, nowhere else have I ever seen so perfect a system of irrigation as this country presents. Five millions of acres that, without the artificial channels that have been made to supply them with water, would be but parched and arid plains for half the year, are converted into the most fertile and beautiful of all Northern Italy.

Their levees are the productions of centuries, and yet there is much that we might learn from them that would benefit us in the construction of our necessarily new ones. There the people at an early day learned that a mountain torrent, perhaps five times its usual height during Spring floods, must, as it neared the plains below and its current necessarily checked, either be doubled in depth, if kept within the same narrow channel with levees of corresponding height to keep it there, or it must be allowed to spread four or five times its ordinary width, and there confined within comparatively small levees, but more securely than can possibly be done in deeper and narrower channels.

Thus we find all their levees placed back from three hundred to five hundred feet from the banks of the streams. The levees and the land between them and the river is planted with mulberry trees, that in a few years become a perfect forest, and completely protecting the levees proper from all danger of a rapid and destructive current; and the leaves of the mulberry trees, sold by authority of the Government, more than keep the entire levee system of this portion of Italy in constant and complete repair.

AGRICULTURAL ESSAYS.

SILK CULTURE IN CALIFORNIA.

ITS HISTORY, PRESENT AND FUTURE PROSPECTS, AND INSTRUCTIONS TO THE NEW BEGINNER.

BY I. N. HOAG, OF YOLO.

As early as eighteen hundred and fifty-six a Committee of the California State Agricultural Society, upon visiting the gardens of Louis Prevost, of San José, found a nursery of twenty-five thousand mulberry trees growing, as they say in their report, "very finely." Upon this nursery the Committee remarked as follows: "The Committee cannot pass the garden of Mr. Prevost without a particular notice of his efforts to introduce into our State the cultivation of the mulberry, and we may safely say he is the pioneer in this new work of silk raising. The Committee most warmly commend this enterprise; and in noticing this fine plantation of over twenty-five thousand mulberry trees, they feel that at least a just and appreciating notice of his laudable exertions is due to him at the hands of the Visiting Committee. Mr. Prevost assured us that no country in the world was more favorably adapted to the raising of the silkworm than California, from the fact of the absence of explosive electricity, which is peculiarly injurious to the worm; and another favorable feature is the dryness of our atmosphere. From all the facts gathered thus far we may look to a new era by the introduction of the mulberry culture as the certain forerunner of silk culture."

On the seventh of August, eighteen hundred and sixty, Mr. Prevost, in a letter to the California Farmer, stated: "My silkworms began to work last Sunday, and now a large number of fine cocoons can be seen."

From eighteen hundred and fifty-six to eighteen hundred and sixty Mr. Henry Hentsch, a French banker of San Francisco, believing with Mr. Prevost in the peculiar adaptability of our State for the success of the silk culture, made three several importations of silkworm eggs, the first two of which were unsuccessful, and from the third importation, in eighteen hundred and fifty-nine, Mr. Prevost made the first success as above announced.

But in the meantime, Mr Prevost, becoming discouraged in the effort to get eggs, and finding no sale for the trees, had destroyed a large portion of that twenty-five thousand he had growing in eighteen hundred and fifty-six—an act which he has had many an occasion since to regret. From eighteen hundred and sixty to eighteen hundred and sixty-six Mr. Prevost continued to persevere in his favorite industry, but he met with very little encouragement, except in a small award of premiums by the Agricultural Societies at whose Fairs he made exhibitions of the worms at work, and of cocoons and raw silk reeled therefrom. At many, and indeed all, of the Fairs at which he made such an exhibition it proved a most interesting and attractive feature, and was slowly but surely preparing the public mind for a more substantial encouragement from a more influential quarter. Just ten long years after Mr. Prevost raised his first mulberry trees in his nursery he was made happy by a recognition of his enterprise and perseverance by the highest authority of his adopted State.

In the year eighteen hundred and sixty-six—our Legislature being in session—several parties, prominent among whom was L. Prevost, Wilson Flint, and the writer of this article, who had become satisfied that silk culture would flourish in our State and become one of the leading industries, if once fairly started, suggested to members of the Legislature the propriety of offering liberal bounties, first, for the production of the mulberry trees, and second, for the production of cocoons.

The suggestion was looked upon favorably, and the following bill was drawn up and introduced in the Assembly by the Honorable Charles F. Reed, President of the State Agricultural Society—who was a member of the Legislature that year from Yolo County—and on the second day of April it received the signature of the Governor and became a law:

AN ACT FOR THE ENCOURAGEMENT OF SILK CULTURE IN CALIFORNIA.

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. There shall be paid, from any money in the Treasury not otherwise appropriated, to the producer claiming a premium under the provisions of this Act, the following sums for each of the articles herein enumerated grown within the State of California for the term of four years from the passage of this law.

First—For each plantation of five thousand mulberry trees of the age of two years, two hundred and fifty dollars.

Second—For the production of each one thousand silk cocoons, three hundred dollars.

SEC. 2. The conditions and requirements of the Act entitled an Act for the encouragement of agriculture and manufactures in California, approved April twenty-fifth, eighteen hundred and sixty-two, and also of the Act supplemental to the same, approved April twenty-seventh, eighteen hundred and sixty-three, are made applicable to this Act.

Stimulated by the inducements of this Act, a few parties set themselves at work and collected cuttings from the mulberry trees found at that time in the State, and planted them the same season. It should also be remarked here that the liberal premiums offered in this law for the production of silk cocoons excited a lively interest in this department of the business. Through the exertions of the late Wilson Flint, and the free use of Agricultural Hall tendered by the Board of Agriculture, Mr.

Prevost was induced to bring a very large number of worms to Sacramento and feed them in the Hall. He was also moved to this by reason of there being more mulberry trees in and within reach of Sacramento than in any other place in the State, and also for the reason that he wanted to make a public feeding under the auspices of the State Society, and thus wake up public attention to the new industry.

It was intended to have commenced the feeding at the Hall about the first of July, when there would have been a plenty of food, but in consequence of an imprudent exposure of the eggs to the heat of the early warm weather, while Mr. Prevost was absent from home, they commenced hatching about the third of May, and it became necessary to feed them thus early. In consequence of this unlooked for circumstance the food fell short, and a resort was had to the leaves of the Osage orange, which the worms will eat very well, and which is by science classed as one variety of the mulberry. This change of food was undoubtedly very unfavorable; but what was still worse, some leaves of the mulberry that were shipped from Marysville in sacks had become heated before they were fed to the worms. This heated food immediately affected the worms unfavorably, and a disease set in among them, and consequently the whole enterprise—or feeding at the Hall—proved a failure. As the cause of the failure was so apparent, it proved no discouragement to those engaged in the enterprise, but rather stimulated to renewed efforts. The State Agricultural Society having thus given its countenance and practical assistance to the new industry, public attention was attracted towards it, and its final success was guaranteed. In this connection, it is due to a correct history of the subject that the efforts of the State Society, through its officers, should be properly recorded. We can do this in no more appropriate manner than by quoting from a letter written by Mr. Prevost himself, dated July seventh, eighteen hundred and sixty-six. After enumerating the difficulties under which he had labored and the causes of the failure, he says: "I feel it my duty to state here, before closing my letter, that the officers of the State Agricultural Society have done for me all they possibly could, and the Secretary, Mr. Hoag, in particular. Without his aid I should have had to give it up. Anything I could say would be below the level of his courage, energy and devotion to the noble cause."

From trees grown in the year eighteen hundred and sixty-six, a large number of cuttings were made and planted in the Spring of eighteen hundred and sixty-seven. There was also imported from France and Japan some four hundred pounds of seed, and most of this was also planted. The cuttings generally grew very well, but the seed, though good, was not generally successful—probably from the fact that those planting it did not understand its nature. The writer of this article, as administrator of the estate of the late Wilson Flint, who imported the seed and who had grown a large number of trees from cuttings, came into possession of the same. From the cuttings I raised some one hundred thousand *morus multicaulis*, and from about twenty-five pounds of seed something like two hundred and fifty thousand of the *morus alba* and *morus morretti*. There were raised in the State this year from four to five hundred thousand trees, and there were also produced about two hundred thousand cocoons. The business seemed prospering pretty well for a new enterprise, managed by those who had previously had no experience in it. All who had engaged in it began to feel sanguine of its final success, and were making every arrangement for embarking more heavily in the industry.

At the meeting of the Legislature in December, eighteen hundred and sixty-seven, some people, who could only see that the State was becoming liable for a pretty liberal sum for mulberry trees and cocoons, but could not see that as a result of this liberality there was growing up a great and important industry to enrich the people and increase the taxable property and revenue of the State with which to pay off these premiums by the time they should become due, began to call on the Legislature to repeal the law, and were not slow to condemn those who had been instrumental in securing its passage. It was even recommended by a State officer, in his report to the Governor, that the law should be repealed to save the State from bankruptcy. Extravagant statements, as to the liability of the State to the amount of half a million of dollars to a few individuals who had been cultivating trees, not for the purpose, as it was alleged, of producing silk or encouraging its culture, but for speculative motives, were made by members of the Assembly and Senate, in their respective houses, and by resolution passed each House. The subject was referred to the Committee on Agriculture, with instructions to report what action ought to be had at an early day. The House Committee very promptly, and without much examination into the facts, reported a bill for the repeal of the law of eighteen hundred and sixty-six.

At this stage of proceedings, those who had engaged in the industry under the inducements held out, and having expended their money in the fulfillment of what they deemed a contract with the State, seeing that action detrimental to their own interests and to what they believed to be the best interests of the State, was about to be had, upon a call for that purpose, held a meeting for consultation and to determine what should be done to disabuse the public mind and guide the action of the Legislature to a proper result. At such meeting the following proceedings were had:

SACRAMENTO, January 20th, 1868.

At a meeting called at the rooms of the State Board of Agriculture for that purpose, it was resolved to form a State Silk-Growers and Manufacturers' Association, and L. Prevost was called to the chair, and I. N. Hoag appointed Secretary. A Committee was appointed to draft a Constitution for the Association; and, after consultation, they reported the following, which was adopted:

ARTICLE I. This Association shall be called the "*Pioneer Silk Growers and Manufacturers' Association of California.*"

ART II. The object of this Association shall be to encourage and aid the production and manufacture of silk in California, by the collection, publication and distribution of information bearing on all branches of the subject.

ART. III. The officers of this Association shall be a President, Vice President, a Secretary and Treasurer; whose duties shall be such as usually pertain to such positions in similar Associations; and who, with one member elected by the Association, shall constitute the Board of Directors.

ART. IV. The regular meetings of the Association shall be held once in every three months, at such times and places as the Board of Directors shall appoint. One of the regular meetings of each year shall be designated the Annual Meeting, and shall be held at the same place, and during the session of the State Fair. At this meeting the Board of

Directors shall make an annual report of their transactions during the past year, including such suggestions as they may deem advisable to further the objects of the Association, and at which the officers for the ensuing year shall be elected.

ART. V. Any person interested in any way in the silk business in this State may become a member of this Association by paying into the Treasury the sum of two dollars and fifty cents, and may continue such membership from year to year by paying an annual fee of one dollar, in advance, at or before the annual meeting.

ART. VI. The office of this Association shall be at the Capital of the State.

ART. VII. The Constitution may be amended at any annual meeting, such amendment having been presented at a previous regular meeting, and spread upon the minutes of the Association.

The officers for the Association were elected, as follows:

L. Prevost, President; W. Wadsworth, Vice President; I. N. Hoag, Secretary; Wm. M. Haynie, Treasurer, and Joseph Neumann, Director.

After consultation and discussion, the Association unanimously adopted the following declaration of principles in reference to the silk business, as founded on the experience of the members:

First—We believe the soil and climate of California to be among the best, if not the very best, in the world for the cultivation of silk.

Second—The mode of cultivation we would recommend is that adopted by L. Prevost, and named by him the "California Silk Culture." This system consists in the cultivation of trees in plantations, as dwarfs, by judicious pruning in the Summer season, and feeding the worms with the branches thus cut off. This system will secure the greatest quantity of food from the acre, economize labor to the best advantage, and guarantee the health of the worm.

Third—A plantation of mulberry trees in California should be so regulated as to general location and distance between the trees, as to secure plenty of air and sun to perfect the foliage. Taking the principles set forth above as a guide, we would recommend that a plantation of trees of the age of two years should not be nearer together than from three to four feet, one way, and from one to two the other, or the equivalent of these distances. After that age they may be thinned out to adapt them to the location and growth of trees.

Fourth—It is the desire of this Association, and they would recommend, that no person should receive a premium or bounty under the provisions of the law for the encouragement of silk culture unless his trees be set out in plantation form, in accordance with the above principles and directions; nor unless he be engaged, in good faith, in making silk or having the same made from those trees, in accordance with the spirit of such law.

A Committee, consisting of W. Wadsworth, I. N. Hoag and A. P. Smith, was appointed to draft and present to the Legislature a memorial in favor of the silk interest of California. The President was afterwards added to the Committee, and the Association adjourned to the call of the Board of Directors.

The Committee so appointed performed the duty imposed upon them, and drew up and presented to the Legislature, through the Committee on Agriculture in the Senate, the following memorial. The same was

referred back to the Committee on Agriculture, and double the usual number of copies ordered printed for the use of members:

MEMORIAL.

To the Honorable the Senate and Assembly of the State of California:

The undersigned, a Committee appointed by the Pioneer Silk Growers and Manufacturers' Association of California, for the purpose of memorializing the Legislature in favor of the silk culture of the State, beg leave most respectfully to submit for your candid and careful consideration the following facts and suggestions:

The production of silk is confined by climatic influences to but few countries, and flourishes best in a warm, dry climate, where the atmosphere is well charged with electricity, but where that electricity is not subject to sudden changes, as by lightning and thunder storms. France, Italy, Prussia and other countries in the central and southern portions of Europe, which have been for a long time the principal countries from which the world has been supplied with raw silk, have been experiencing for the last half century a gradual change of climate unfavorable to silk culture, so that they are forced to import annually, from dryer countries, the eggs, in order to secure the health of their worms and a consequent crop of silk. Even with this precaution, great fears are entertained by those countries that they will be obliged to give up its cultivation as a leading article of industry and export.

The Government of England, seeing this fact, and quick to take advantage of it, is putting forth extra exertions by subsidies to individuals and other encouragement, and endeavoring by the establishment of the silk culture in her East India possessions, to supplant these countries in supplying the world with silk; and she has already become an exporter of more manufactured silks than all other nations combined.

While the production of silk is thus confined to limited portions of the earth by climatic and other causes, the consumption has been rapidly increasing, so that instead of being an article of luxury only indulged in by a few, as was the case but twenty years ago, it has now become, by the customs of society, one of the necessaries of life, constituting in some shape a part of the clothing worn by almost every man, woman and child in every country and in every community. The value of the annual importations of silk into the United States must strike every one who has not given the subject a careful examination with amazement, and those who have examined the subject and appreciate its magnitude are even greater wonderers that no effective steps have been taken by our General Government to supply, to some extent at least, the enormous demand for the consumption of our people.

In general terms, we will state that the average annual value of such importation for the last ten years has been from twenty-five million dollars to thirty million dollars, showing a constant and rapid increase from year to year. From official reports of the commerce of the United States for eighteen hundred and sixty-six, we learn that the value of raw and manufactured silks imported during that year was thirty-one million seven hundred and ninety-three thousand eight hundred and one dollars. Upon this was paid in impost duties, by the importers, the sum of sixteen million five hundred and forty-seven thousand eight hundred and sixty-eight dollars, making the value in the Custom-houses, not counting other expenses, forty-eight million three hundred and forty-one thousand six hundred and seventy-four dollars.

The above is the value of the import of raw silk and goods of *all* silk. The value of mixed goods, composed in a greater part of silk, for that year, was two million four hundred and ten thousand and sixty-eight dollars. The duty on the same—eight hundred and forty-three thousand five hundred and twenty-three dollars—being added, increases the value of these goods in the Custom-house to three million two hundred and fifty-three thousand five hundred and ninety-one dollars, which being added to the forty-eight million three hundred and forty-one thousand six hundred and seventy-four dollars, makes the whole value of silks imported, including impost duties, fifty-one million five hundred and ninety-five thousand one hundred and fourteen dollars.

To show the real cost to the importers, there should be added to this sum, for insurance, freight, interest, wharfage and other incidental expenses, at least ten per cent., making fifty-six million seven hundred and fifty-four thousand six hundred and twenty-five dollars. Would we follow the examination still further, in order to ascertain the amount of money the people of the United States—the consumers—really pay annually for the silks worn by them, we must add to this sum at least twenty-five per cent., or fourteen million one hundred and eighty-eight thousand six hundred and fifty-five dollars, to cover profits to importers, jobbers and retailers, making the enormous sum of seventy million nine hundred and forty-three thousand two hundred and eighty dollars.

In the above statement the value of the silk imported into the revenue district of New Orleans is not included, the same not having been received by the Revenue Department when the amount reported was published. The addition would probably increase the above figures to over eighty million dollars, and when the relations of the Southern States shall have been fully restored, and industry and social intercourse shall have been again established, it is not out of the way to assume that the consumption of silk in these States will be at least one third what it is in the Northern States.

With these figures before us, is it strange that we should begin to look about us to see if we have not somewhere within our borders a country adapted to the culture of silk? Is it not the duty of statesmen not only to try and find such a place, but, when found, to stimulate the culture of silk by granting such liberal Government aid to individuals as will most certainly give the subject a thorough test, and to extend such aid through a number of years, until the industry is thoroughly established on a sure foundation.

The Government or State whose people pay such a tribute to the industry of other countries, and neglects to do this, is most certainly derelict in its own interests and duties, and neglectful of the interests and welfare of its own people.

In the Atlantic States the experiment of introducing the silk culture has been tried for a succession of years, but has been finally most entirely abandoned, for the reasons: First, that no Government aid was extended to those who were disposed to go into it in good faith, and repeated failures and bankruptcy of individuals who begun the production of trees more for speculative motives than otherwise, so discouraged those who had the success of the industry at heart, that all gave it up; and we hear of it now only as the "*multicaulis* speculation."

The second reason why it failed in the Atlantic States is found in the fact that in the warmer portions of the country—the Southern States—where it would have succeeded, if anywhere, and where the climate is

almost as favorable, and perhaps equally so, to the health and vigor of the worm, and consequent success of the business, as that of France or Italy, yet the atmosphere is too damp and they have so frequent thunder showers and shocks of electricity, that if in those States silk could be produced with tolerable success, it is probable that, like Italy and France, they would have annually to resort to dry and more favorable climates for their eggs, which would be a great drawback to the success or profits of the business.

Another reason, and one that has been too generally overlooked by writers on the subject, why the silk culture failed in the Southern States, is found in the fact that just about the time that experiments were being made there the cotton gin was invented and introduced, and this gave to cotton growing such a stimulus that all other industries were lost sight of, and the whole country turned its attention to the production of cotton.

But now we turn to our own State, California, and what do we find here? While we have a soil and climate which is a marvel to the world for the production and perfection of all other animal and vegetable life, yet it seems as though nature has selected this spot and concentrated all her energies and laws in producing here all the conditions most favorable for the fullest perfection of the mulberry tree, and its natural accompaniment, the silkworm. Experiments already made in the culture of the tree and the feeding of the worms have been so favorable as to warrant the belief in results far in advance of anything found in their history in any other time or country.

Here, in our dry, pure and equable climate, the leaf of the mulberry secures the most abundant nourishment, and the most perfect texture and fibre.

Here, during the season for feeding the worms, from June to October, we have no rains to wet the food, no sudden changes in the atmosphere to check the growth of the worms, no explosions of electricity or thunder storms to benumb or kill them. And during experiments conducted by an experienced and careful hand for the last ten years in San José, and by many other persons for the last three or four years in all portions of the State, not a diseased worm has been discovered. While in all other countries the loss from these causes is scarcely ever less than twenty-five per cent., and frequently more than thirty-three, here it may be said to be absolutely nothing.

Nor are these all or even the greatest advantages we possess; but as a result of them, one man can feed and take care of as many worms in California as from seven to eight men can in Italy, France or any of the at present great silk growing countries of Europe.

Again: Cocoons produced in California and sent to experts in France have uniformly been pronounced the best the world has ever shown.

The eggs of our worms, when transferred to France or Italy, have already established such a reputation that orders for them far exceeding the whole quantity ever produced in the State, and much above our present facilities to produce, have been sent here; and one of your memorialists has been solicited to act as agent for dealers in France in selecting and exporting to meet the foreign demand.

In view of the facts above enumerated, the many advantages California possesses over all the old silk producing countries, the enormous price of silk, and the already so great and rapidly increasing consumption by the people of the United States, and the foreign demand for the worms' eggs, our last Legislature passed a law for the encouragement of

silk culture in California, by promising to pay a premium of two hundred and fifty dollars for each plantation of five thousand trees of the age of two years, and three hundred dollars for each one hundred thousand cocoons—the law by its terms to continue in force two years as to trees, and for four years as to cocoons. At the time this law was passed there were but very few mulberry trees in the State, and no seed from which to produce them; consequently, comparatively nothing was done in eighteen hundred and sixty-six toward accomplishing the object the law was designed to effect.

Mr. Prevost, one of your memorialists, who has spent the last ten years of his life and a competency in proving the adaptation of his adopted State to the culture of silk and endeavoring to bring the facts before the people, that the State might be benefited by the industry, has received for trees raised by him and for all the cocoons produced during all these tedious years of toil, and experiment, and waiting, the pitiful sum of five hundred and sixty two dollars and fifty cents in premiums, a sum scarcely sufficient to pay for the postage stamps he has used on letters written by him within that time, trying to introduce his favorite industry among a people deaf to his advice and recommendations, and negligent of what he was proving to them was their own best interests. The heirs of the late Wilson Flint, who during his lifetime did as much for the agricultural reputation of the State as any man now living, and a surviving partner, have also received the sum of one hundred and fifty dollars in premiums under the law, a sum not equal to one hundredth part of the value of the damage done by the late high water to property, most of which was acquired by them in view of the inducements held out by the conditions of the law.

During the year eighteen hundred and sixty-seven, and the last year in which seed can be planted and the trees claim premiums under the law, there has been by the combined efforts of all who have been induced to go into the business, from three to five hundred thousand trees raised, and there has been produced besides those, for which a premium has already been paid, one hundred thousand cocoons, for which the State is liable to the amount of three hundred dollars.

Another fact which it may be well to mention as having a very great bearing upon this industry, and which is very much to be regretted, is, that there is not now in the State more than five persons who have any eggs from which to hatch the worms for the production of cocoons in eighteen hundred and sixty-eight, and the entire amount of eggs in the State does not exceed about three pounds.

Your memorialists regard it as a matter of great regret for the interests of the State that greater success has not attended the efforts of those whose enterprise and public spirit has been called into action by the provisions of the law under consideration.

We believe that it would be greatly to the interests of the State if a scale of premiums, so graduated as to continue the encouragement of the business for a term of years after the expiration of the present law, could be offered by the present Legislature.

We believe that if the State were to be called upon during the next ten years for the amount of two hundred thousand dollars for premiums under the law, that amount of money would be better expended, and would benefit the State and people more than any two hundred thousand dollars that has ever yet been drawn from the Treasury. Money paid by the State as premiums for the successful prosecution of an industry like silk culture is only loaned to individuals, and will come back in a

very few years in the shape of taxes with a hundred fold increase. California, according to official reports, is paying annually between six million and seven million dollars for silks imported. Would it not be better to pay even a quarter of a million in the course of ten years to her own citizens, if by so doing, after that time these citizens will supply this silk and thus keep this money at home, and add so much each year to the permanent wealth of the State? It seems to us that this would be a good financial operation, and a good point gained in political economy.

Ask England how she became the greatest manufacturing country in the world, and her answer is, by the encouragement of her manufactories by subsidies and bounties to individuals.

Ask Napoleon how France came to be the greatest wine and silk producing country in the world, and he will tell you by the fostering care and encouragement of the Government.

Ask Germany why mulberry trees are found growing on every roadside, and about every dwelling, and why every house is a cocoonery, and she will point to a law of her Diet compelling every owner of land to plant mulberry trees and make cocoons.

But we need not go away from home for examples of the good effects of Government aid to private enterprise. In eighteen hundred and sixty-two the State passed a general bounty law for the purpose of inducing and encouraging new branches of industry. Under the operations of that law, and the additional encouragements and aids held out by the State Agricultural Society, there has sprung into existence within our borders, cotton mills, woollen mills, powder mills, oil and white lead manufactories, paper factories, boot and shoe and leather factories, shot and lead factories, sugar factories, glass factories, resin factories, turpentine and beer distilleries, hop fields, cotton fields, tobacco fields, flax and hemp fields, and sugar beet fields—all creating property which contributes annually to the national and State revenues four times more money than the State has ever been called on by them for bounties under the law which has brought them into existence. These facts are capable of proof, and are familiar to one of your memorialists, whose business it has been for the last five years to watch and assist the operations of this law as he would watch the growth and conduct of a favorite child.

And yet, with all these facts—which are matters of history, and should be known to every one, and more especially to legislators—we learn with regret that there is now pending before the Legislature a bill to repeal the law of eighteen hundred and sixty-six for the encouragement of silk culture in California. Let us examine for a moment the effect of such repeal. The Legislature could not now if they would—and we certainly cannot believe they would if they could—prevent the payment of the premiums on trees already planted, for the planting of the trees by individuals is the acceptance of a proposition made to them by the State, and there has by such acceptance become a solemn contract, and the money is as sure to be paid as though the warrants were already drawn on the Treasurer by the Controller. Therefore, as by the terms of the law, the State's liability for premiums on trees cannot now be changed, the only effect produced by a repeal of the law would be to prevent the payment of premiums on silk, and thus after paying premiums, or becoming liable therefor, on the trees, to discourage the use of those trees for the very object for which the State has created them, and render them comparatively valueless both to individuals and to the State.

The real object of the law was to encourage the production of *silk*, and to place the industry on such a sure road to success, and advance it to that position that individual enterprise, stimulated by profits to be derived from the business itself, could and would continue it until it became one of the permanent and profitable industries of the country. Individuals need this encouragement, and without it they *cannot and will not go on.* Manufactories cannot be established and maintained here unless the raw material is found for them to live upon, and there will be no raw material unless a demand is created in some way *for* that raw material.

The object of the law was to create that demand and stimulate the production until a sufficient amount was produced to start and maintain the factories; and after that let the factories step in and take the place of State aid. When this point is reached State aid will no longer be needed. The relations of producer and consumer, of demand and supply, will then have been established; the State will have accomplished her object in the passage of the law, and silk culture and manufacture in California will have become a fixed and valuable fact.

Another consideration: We doubt very much whether the State can by a repeal of the law dissolve her contract and withhold the premiums on cocoons she has promised from those parties who are now prepared with the trees and eggs for the production of silk. If a party has invested his money in eggs, he has accepted the proposition; and if he goes on in good faith and produces cocoons from those eggs, has he not fulfilled the contract on his part for the production of silk? Can one of the contracting parties dissolve the contract at will without the consent of the other?

But suppose the State could, after paying for the trees now growing, withhold the premiums for cocoons, would it be wise to do so? By so doing she would nip in the bud an industry which, if allowed to continue under her fostering care, and encouragement held out, would grow to be the first industry of the State. The wine interest, the wool interest, the grain interest, and even our *exhaustless mines* of precious metals would be but secondary to silk culture.

In proof of this proposition, we point to the value of our annual importations of silk, for which we are exporting an equal in value in gold to the amount of from seventy-five million to eighty million dollars per annum.

The demand is already at our doors, asking to be supplied. Shall we prepare to supply it, as we can, or shall we now, by adverse legislation, discontinue the effort?

The golden apple hangs invitingly at our very hands. Shall we put them forth and pluck it, and thus secure forever the prize for which the old countries are struggling, or shall we, through neglect, through indifference, or through a want of energy and enterprise, coupled with a short-sighted cupidity, allow them to continue in triumph to carry it away from us?

Again, the impetus given silk culture by the passage of the law in question has created a California silk fever in the silk producing countries of Europe.

The rich silk merchant, the business silk manufacturer, and the skilled silk producer, have their eyes and heads turned towards California, and if we continue the inducement they will soon be among us, putting out silk plantations, building silk cocooneries, establishing silk factories, and trading in our California produced silks. Shall we by adverse legisla-

tion turn this most valuable immigration from our shores, when the greatest of California's wants is immigration? Or shall we continue to hold out the invitation given, and thus bring an industrious population among us?

All of which is most respectfully submitted.

I. N. HOAG,
W. WADSWORTH,
L. PREVOST,
A. P. SMITH.

The foregoing memorial being thus officially printed and laid on the desks of the members of the Legislature, at a time when their attention had been called to the subject by representations that the State was in danger of being bankrupted by a few silk growers—or rather mulberry tree growers—who, as it was said, cared nothing for the industry, but only desired to get the money from the Treasury, attracted general attention, and was carefully read by both Senators and Assemblymen.

It contained facts in regard to our climate, so favorable to the silk culture—in regard to the enormous quantities of silk goods annually imported into our country, and the astonishing amount of gold exported to pay for them—the disease of the worms in the old European silk producing countries causing a constant increase of the price of silk—and the many advantages which would accrue to our State by a continuance of the encouragement, and disadvantages which must follow a discontinuance of such encouragement—in fact, the subjects treated of were new and interesting, and challenged the attention of those whose business it was to know the truth and act upon it.

The effect was as anticipated by the author of the memorial—a good one for the cause of silk culture in California.

Legislators were no longer frightened at the prospect of an impoverished Treasury and bankrupted State in consequence of the payment of a few premiums for mulberry trees. They saw that in the payment of these premiums the State would in the end be largely the gainer—that a new and valuable industry would thus be introduced and permanently established within our borders—that the large amount of gold which had been constantly flowing out of our country to recompense labor and create capital in foreign lands would thus be retained and distributed among our own people, thus creating wealth among her citizens and taxable property from which to replenish the State's Treasury. The silk growers who had planted their thousands of mulberry trees and secured their millions of eggs, for the purpose of prosecuting in good faith the silk business among us, were no longer looked upon as would-be robbers of the public Treasury, but both they and the enterprise were regarded with increased favor, and as entitled to continued and additional encouragement.

In accordance with this change of public opinion, and to extend an additional sanction of the Legislature to this enterprise, the Hon. Mr. Robinson, Senator from Alameda County, and an active and intelligent member of the Senate Agricultural Committee, introduced, in the early part of the session, the following bill, which, without a single amendment and without any opposition, passed both branches of the Legislature, and on the last day of the session, the thirtieth of March, received the approval of the Governor, and is now the law of the State:

AN ACT FOR THE ENCOURAGEMENT OF SILK CULTURE IN THIS STATE.

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. There shall be paid, from any money in the Treasury not otherwise appropriated, to the producer claiming a premium under the provisions of this Act, the following sums for the articles herein enumerated, produced or grown within this State, for the term of four years from the second day of April, eighteen hundred and sixty-six:

First—To each person one premium of two hundred and fifty dollars for growing and cultivating five thousand or more mulberry trees of the age of two years, planted in suitable form and at proper distances for permanent silk culture.

Second—For the production of each one hundred thousand silk cocoons, in good merchantable condition, three hundred dollars; but no person shall receive a premium for any cocoons on which he has already been paid a premium.

SEC. 2. Any person or persons hereafter claiming a premium under the provisions of an Act entitled an Act for the encouragement of silk culture in California, approved April second, eighteen hundred and sixty-six, shall be and are hereby excluded and debarred from receiving any premium under the provisions of this Act; and no person claiming under this Act shall be entitled to or receive any premium under said Act of eighteen hundred and sixty-six.

SEC. 3. The conditions and requirements of the Act entitled an Act for the encouragement of agriculture and manufactures in California, approved April twenty-fifth, eighteen hundred and sixty-two, and also of the Act supplemental to the same, approved April twenty-seventh, eighteen hundred and sixty-three, are made applicable to this Act.

SEC. 4. An Act for the encouragement of silk culture in California, approved April second, eighteen hundred and sixty-six, is hereby repealed.

SEC. 5. This Act shall take effect and be in force from and after its passage.

It will be seen by a comparison of the two laws that the Legislature did not attempt to interfere with the vested rights acquired under the law of eighteen hundred and sixty-six. The law of eighteen hundred and sixty-eight is in every essential particular a re-enactment of that of eighteen hundred and sixty-six—the only material difference being a provision in the law of eighteen hundred and sixty-eight that trees to be entitled to the premiums must be "planted in suitable form and at proper distances for permanent silk culture."

This is an excellent provision, and should have been embodied in the old law—its object being to secure good faith on the part of those who plant trees, and to secure the use of them for making silk. It also indicates the opinion of the Legislature of eighteen hundred and sixty-eight that those who claim premiums on trees under the old law should not be entitled to such premiums unless their trees shall be thus "planted in suitable form and at proper distances for permanent silk culture."

By an examination of the principles adopted by the Silk Growers'

Association it will be seen that they take the same position, and even go further, and advance the opinion that no one should be granted a premium on trees under the law unless in good faith engaged in the production of silk from such trees.

To prevent persons claiming premiums twice on the same trees or cocoons, the law of eighteen hundred and sixty-eight very properly provides that any person or persons hereafter claiming a premium under the provisions of the law of eighteen hundred and sixty-six shall be deprived or debarred from receiving any premiums under the law of eighteen hundred and sixty-eight, and so the contrary.

This provision is also intended as an inducement for parties to abandon their claims for premiums on trees under the old law, by saying to them, if you press such claims and accept such premiums you shall not be entitled to any premiums on cocoons or trees under the new law. In this respect the law will undoubtedly produce the desired effect, as it will be to the interest of all parties who have not a very large number of trees to abandon such claim and accept instead the premium of two hundred and fifty dollars on his trees under the new law, and thereby secure the premium of three hundred dollars for each one hundred thousand for all the cocoons he can produce in the next two years.

But the best feature of the new and present law is the inducement held out to parties to engage in the silk business up to the very time of the expiration of the law, namely—the second day of April, eighteen hundred and seventy. Any person who, before this last date, shall be growing and cultivating five thousand or more mulberry trees of the age of two years, planted in suitable form and at proper distances for permanent silk culture, is promised a bounty of two hundred and fifty dollars, or the rate of five cents for each tree so planted. Thus trees of the age of one year can be obtained from the nurseries and planted in the Winter or Spring of eighteen hundred and sixty-nine, and coming of the age of two years before April second, eighteen hundred and seventy, will be entitled to the bounty.

In this climate, it is the opinion of those who are engaged in the business, and who have followed it in other countries, that trees may be planted to the best advantage for permanent silk culture at distances of from three to four feet one way, and from one to two the other. By adopting the plan of feeding the worms with the branches much labor is saved and the trees are kept headed back within the reach of the picker, without a stool or ladder, thus producing dwarfs, and enabling the leaves to be well exposed to the rays of the sun, even when planted thus near to each other. By thus planting in plantation form, they can be very easily and economically cultivated and kept in luxuriant foliage through the Summer, and will afford a much greater amount of food to the acre than in any other plan of planting and cultivation. One acre of land planted with trees in rows four feet apart, and two feet from each other in the row, will contain five thousand four hundred and forty-four trees, and will entitle the owner to the bounty of two hundred and fifty dollars, as an inducement or encouragement to enter into the business. Besides this liberal offer, the State proposes to pay him the sum of three hundred dollars for each one hundred thousand cocoons he shall produce from these trees at any time before the expiration of the law—April second, eighteen hundred and seventy. Five thousand thrifty trees two years old will furnish food for five hundred thousand silkworms in one Summer, and thus the owner of such a plantation can realize from his cocoons made therefrom the nice little sum of fifteen hundred dollars,

which, added to the two hundred and fifty dollars bounty for the trees, will make seventeen hundred and fifty dollars—from one acre of land in one year. And last, and not least, the land, trees and cocoons will still belong to the original owner for future use or disposal. The land, with such a plantation on it, will be more valuable than if covered with the best variety of bearing grapevines or trees of any other kind, and the cocoons will be worth in the market from one and a half to two dollars per pound. With such a showing, who will hesitate to engage in the silk business in California?

A silk plantation will last and be a constant source of profit for a lifetime, or even half a century, and the land bordering our large rivers is the best adapted to the mulberry tree—this tree being, like the willow, improved, or not in the least injured, by the overflows which occur along these rivers almost annually in the Winter season. Crops requiring to be planted annually along the Sacramento, San Joaquin, and other rivers of the State subject to inundation, are, to say the least, very uncertain—in fact, these lands may be said to be valueless for such crops, and yet they are the most valuable lands in the State for silk culture, and if properly planted and cultivated in this business, will yield more profit per acre than any other lands in the State or the world. To the owners of such lands we would say, then, be not discouraged; plant mulberry trees to enable you to make a beginning; the State offers to pay five cents a tree towards the first cost of the first five thousand planted, and to pay you a good price for the first cocoons you raise, as an additional encouragement. If under such circumstances you do not embrace the opportunity offered to render your lands valuable and yourselves and families comfortable, if not wealthy, it may well be doubted if you deserve success. But I know you will embrace it and improve it; all you want is the proper knowledge on the subject to enable you to see probable success as the reward of your efforts.

Having given a brief history of the rise and progress of silk culture in the State, and stated my faith in its future success and great importance, I will now proceed to offer a few plain instructions which may prove of some benefit to those who, unacquainted with and inexperienced in the business, may desire to undertake it.

LOCATION.

In selecting a location for the silk business, the climate and soil must be taken into consideration. In regard to climate in California, there is but one thing to be guarded against. So universally is our climate adapted to the business in all its departments, that in all places, from Siskiyou to Los Angeles, where experiments have been made, they have proved successful—far beyond anticipation. The one thing to be shunned is the damp foggy climate of our Summers and Autumns in the coast counties. In every other locality in the State the climate may be said to be perfect.

SOIL.

Any soil that will produce a healthy and vigorous growth of the various kinds of fruit trees, and more especially the peach tree, will also produce the mulberry in great perfection. It must be remembered, however, that fruit trees are valued for their fruits and not for their leaves, while the mulberry is valued for its leaves and not its fruit. Hence, it often happens in this State mulberry trees are most valuable on lands

where fruit trees are least valuable. The rich alluvial river bottoms—too rich and too much subject to overflow in the rainy or Winter seasons for successful fruit culture—are the very lands to be selected for silk culture. Hence, in Italy, in the rich plains of Lombardy and along the banks of the river Po, even within its levees, are found the most productive silk plantations. An excess of alkali in the soil should always be avoided. The tree will not flourish in it, nor will the worm do as well on the leaves grown from an alkali soil. It must not be inferred from the above that other lands than our river bottoms are not adapted to the silk culture—only, that they will produce the greatest quantity of food to the acre, and are better adapted to silk culture than anything else. Our foothills are eminently successful in the production of the mulberry tree and the cocoons. Indeed, it is believed that the quality of the cocoons raised on the high lands may be superior, but the quantity cannot be greater than the low lands will produce

I am aware that in most countries it is laid down as a rule that the low rich land is not so well adapted to silk culture as higher, lighter and less rich soils.

The reason given is that on the former quality of lands the mulberry leaf secretes too much water, and is not so healthy, and does not contain so much of the resinous substance which fills the silk vessels of the worms, and therefore does not make so much silk or so fine, smooth and strong a fibre. This rule does not hold good in California, where we have no rain from May to October, to be absorbed by the leaves or drank up by the roots of the trees; and consequently the leaves grown on our low bottom lands along the rivers are dryer and contain more resinous matter, and smoother and stronger fibre, than those grown on lighter and higher soils in countries subject to frequent Summer showers. It is a well-established scientific fact that all vegetable substances grown in a dry climate, and without irrigation, contain more saccharine and resinous matter, and consequently more nourishment for man, beast or insect, than the same vegetables grown in a wetter climate. Our hay, for instance, has more resin and consequently more nourishment in it than hay grown in the Atlantic States or Europe. So with the leaves of trees. The mulberry leaf has more resin—and, as before intimated, this is the material which forms the silk—than the same leaf in damper climates. It must be remembered that after the month of May all our rivers, which overflow during the Winter season, are within their banks, and their waters soon go down to low water mark, thus leaving the lands along their borders from fifteen to twenty feet above their waters. The principal portion of the leaves of mulberry or other trees standing on this land is grown after this period, when the soil is dry and in good condition—even better condition for making a healthy and even growth than if upon the hilly portions of a country where rain and drought succeed each other during the Summer season. This evenness of the growth of the leaf without rain or other climatic change is of the first importance, and is one of the strong points in favor of our climate for silk culture. Another very strong reason for recommending the mulberry for our overflowed districts is found in the fact that they throw down very deep tap roots as well as lateral roots, and are therefore not easily washed out, but may be depended on to hold the soil to its place while the water is sweeping over it. This fact undoubtedly led the Italian Government to adopt this tree to protect their levees along the river Po and its tributaries, and we should adopt it along our rivers for the same purpose, thus

making it contribute to the safety of our homes and the comforts of our families. I would not discourage the silk culture on our high land or in the foothills, but these lands are also valuable for grain farming, and the foothills especially for grape and tea culture—and while I would like to see the mulberry, the vine, the tea plant, the orange, lemon and some other tropical fruits flourishing side by side, as they may and in time will, all along the foothills of the Sierra Nevada and coast ranges of mountains the whole length of the State, I am also anxious that our vast river bottoms shall be cultivated with something that will not require annual planting, and that will live and flourish and produce remunerative crops notwitstanding the Winter and Spring floods. If there is any annual crop, or crop requiring to be planted every year, better adapted to these low bottom lands than another, I am of the opinion that crop is the sugar beet. This crop will grow and come to sufficient maturity for sugar purposes after the water leaves the soil. This will at no distant day be one of the leading industries of the State; and the farmer on the rivers will find that he can very appropriately and handily cultivate the beet and mulberry together; not on the same piece of land—but that he can conveniently attend to a crop of each. He may also cultivate hops in connection with both—selecting for the latter his highest bottom land, upon which the water will remain the shortest time.

THE MULBERRY TREE—ITS PROPAGATION AND TREATMENT.

There are quite a number of varieties of the mulberry trees, but those most commonly used in the production of silk are the Morus Multicaulis, Morus Alba and Morus Morretti. The Multicaulis is the most rapid grower and produces the greatest quantity of leaves. It is the easiest propagated from cuttings, and is most easily managed as a dwarf for plantations. It is not so much used for feeding worms in European countries as the Alba and Morretti, as its leaf absorbes more water, and it is believed, therefore, not to be so healthy in those wet climates for the worm. It is very doubtful whether it is liable to this objection in this climate. It is certainly preferable to feed worms on until they are from ten days to two weeks old, as the leaves are more tender. Indeed, worms fed entirely on the leaves of the Multicaulis have uniformly done well in this State and made most excellent cocoons. The Alba and Morretti are very nearly alike in their habits and appearance, the greatest difference being in the color of their berries—the former bearing white berries, and the latter those of a purple color. The wood of these varieties is harder and more compact than that of the Multicaulis, having very much the appearance and texture of the locust. The tree makes a most rapid and beautiful growth, and forms one of the most beautiful and agreeable ornamental or shade trees. Though not so easily propagated from cuttings as the Multicaulis, yet they may be readily grown in this manner. The cuttings should be taken from the tree, in this State, in December or January, and immediately planted in the ground; though, if the ground is not ready, they may, like the cuttings of Multicaulis, be kept until February or March by burying in a sandy dry soil or placing them in a cool cellar. For planting they should be cut up into pieces containing from two to three eyes each, and placing them in an upright position in the ground, should be covered so that the upper end will be about an inch below the surface. The land should be well pulverized and sub-soiled to insure success. In eighteen hundred

and sixty-seven, I raised one hundred and thirty thousand trees of the Multicaulis variety, from cuttings, and the average height of the first Summer's growth was more than five feet. From these trees I made, last January, over three million cuttings, which are nearly all up at this time, April thirteenth, eighteen hundred and sixty-eight, and growing finely. This number will supply many a new beginner with his first five thousand trees, and will be of the proper age—two years—in January, eighteen hundred and seventy, to secure the premium under the new law, of two hundred and fifty dollars for each five thousand. If transplanted in the Winter of eighteen hundred and sixty-nine, every five thousand trees will also feed, during the following Summer, from three to five hundred thousand cocoons, which will also be in time to claim the premiums of three hundred dollars for each one hundred thousand. Although I could make more money by keeping these trees and making cocoons from them during the Summer of eighteen hundred and sixty-nine, yet, in order to do what I can to introduce this rich and valuable industry throughout the State, I shall sell a portion of them in lots of five thousand or more at a small advance of what the purchasers can obtain as premiums from the State. The price will probably be about eight dollars a hundred, which will in fact be but three dollars per hundred more than the State will repay the purchaser. Here is a chance for all who desire to go into the silk business with but very little capital. I shall also save a large number of eggs of the different kinds of worms, so that there may be no lack of material to inaugurate this industry very generally before the expiration of the law for its encouragement.

There is no tree that will bear so much pruning in the Summer season and flourish under it as the mulberry. Indeed, this tree seems to have been made with a constitution especially adapted to the use to which it is applied. The mulberry tree was made for the silkworm and the worm was made for the mulberry tree—a perfect adaptation to each other, and both to the wants of man or woman.

The mulberry tree may also be propagated from the seed, which is a little larger than a mustard seed. In this State the seed should be planted in April or May in damp but warm soil, well cultivated or pulverized. It should be covered from a half inch to an inch and a half. If the soil is very damp and not liable to dry on the surface, a half inch is a plenty. The soil should be of that nature that it will keep damp to the very surface. I planted from two to three acres last year with seed of the Alba and Morretti, and only succeeded in making the seed come up on about an acre and a half. They were planted on the Sacramento River, about two miles above Sacramento. In the Winter of eighteen hundred and sixty-five, before a levee was built along the river, the water fan across the land and washed the surface soil, a vegetable mould, entirely off of about an acre and a half of the land, leaving a light sandy clay, through which the moisture rose to the very surface—so much so that until ten or eleven o'clock of the warmest days in May the surface looked wet. Here, on this land, the seed came up and grew well, while on the land directly by its side, but upon which the vegetable or surface soil remained, very few of the seeds germinated, and none came up. As the sun warmed up the surface of this vegetable soil, the moisture receded, leaving the surface very dry and hot; and, as the tender leaves of the young trees reached this dry soil they withered or baked, and died, while the moisture of the sandy and clay soil, reaching the very surface, protected and invigorated the young leaves and forced them up. I have been thus particular in giving my experience in this matter,

because almost every one else who planted seed made an entire failure, and I made a partial success, in consequence of the peculiar condition of some of my land.

I would recommend in putting out plantations that about one half the trees be of Multicaulis and the other half Alba or Morretti; the former to be fed to the worms until the last moulting, and the latter, after that period. I observe that some German authors recommend the Multicaulis above all other varieties, and I am not prepared to say that it will not prove the best in this State for all ages of the worm. It cannot be liable to the objection that it absorbs too much water here, when we have no rains while it is growing.

COCOONERY.

Having selected your location and planted your trees, the next thing to be prepared for use is some place to feed your worms—a cocoonery. Any rough building will do in this State. Our climate is so mild and favorable we can dispense with many of the extra conveniences or necessaries required in many other countries, and, consequently, with much of the expense. But you cannot feed the worms in the open air, for the reason that they must be protected from the sun as well as the night dews; also from the birds. If you have a barn on the place which can be devoted to this use in the Summer season, you have already a cocoonery. All you want to do is to put up upright standards, to which, at about two and a half feet apart, fasten cross pieces and lay on loose boards for shelves, and your cocoonery is made. At about eight feet from the floor your cross pieces will want to extend across the alleyways between the shelves, on which lay a temporary floor to stand on while feeding the worms on the shelves above; and, about six feet above this, make another temporary floor, and so, continuing your shelving up to the roof. All the frame work and boards for shelving can be so made that they can easily be put up and taken down and kept from year to year. Be careful to provide a plenty of ventilation. This may be done in any manner most convenient, so that the wind does not blow directly on the worms. The worms also want plenty of light, but, as before remarked, must not be exposed to the direct rays of the sun.

Of course the size of the cocoonery will want to be regulated by the number of worms to be fed. It estimated that five hundred thousand worms will require, for the first age—that is, from hatching until the first moulting—about one hundred square feet of surface or shelving. For the second age—from the first to the second moulting—about two hundred square feet; for the third age, about four hundred and fifty square feet; for the fourth age, about eleven hundred square feet; and for the fifth age, about twenty-five hundred square feet of surface or shelving. The space required will be greater or less in proportion to the greater or less number of worms to be fed. In Germany nearly every farm-house is devoted to the purposes of a cocoonery during the feeding season, and in many cases this same practice may be adopted here, especially where the house is large and the number of worms to be fed is small.

HATCHING THE EGGS AND FEEDING THE WORMS.

Now we come to the most delicate and important as well as most attractive and interesting portion of the silk culture, and upon the skillful and successful management of this department of the business depends

all its profits, and consequently all the advantage that can be urged in its favor. To this particular branch, then, I would ask the especial attention of every beginner. There is nothing intricate or difficult about feeding and taking care of the worms and making a sure crop of silk, but there are certain things necessary to be done to insure success, and these things are necessary to be done at particular times, and they must absolutely be done at those times. He who would successfully feed silkworms must have a time for everything and everything in its time. Having impressed this idea of perfect regularity and certainty upon the minds of those who propose to feed and care for a family of worms, we will go at once to the work of hatching them from the eggs.

The eggs having been kept in an ice-house or some other place where the thermometer never rises above forty-five or fifty degrees, and where they are in no danger of sweating or becoming mildewed, should be taken out when desired to be hatched, and gradually exposed to the heat of the outside air. A sudden change from cool to very warm atmosphere is considered detrimental. From the middle of May to the first of June is about the proper time to hatch the first crop in this State, as the rainy season is generally past by that time and the weather has become sufficiently warm and settled.

After remaining in a warm atmosphere at this season for five or six or eight days, the little worms will begin to show themselves, and the moment they make their appearance they begin to look for food. Place some tender leaves from the Multicaulis, on the paper and they will at once begin their occupation for life—eating.

At the end of the first day after they begin to hatch, take all the worms off the paper containing the eggs and place them on separate papers. This can be done by removing the mulberry leaves upon which they are feeding. Do the same thing for about three days. By this time all the eggs that are good and strong are likely to have hatched. The balance may be thrown away. All hatched the first, second and third days must be kept separate, and for this purpose may be marked first, second and third, by a pencil, on the papers containing them. The object of this division is that you may feed and treat those of the same age exactly alike. One day's difference in the age of an insect that has only from twenty to thirty days to live, it must be remembered, is a good deal. And especially is this the case with the silkworm, which in that short period of time goes through five different and distinct periods of existence. The transformation from one of these periods to another consists in shedding the skin, or, in other words, laying off the old garment. These changes are called moultings. While undergoing any one of these five changes, which occupies from twenty to twenty-four hours, dependent on the health and vigor of the worm, they will not eat, nor must they be fed or in any manner disturbed. In this fact will be seen the reason for keeping each day's hatching separate; for when the first day's hatching is five days old they begin their first moulting, and if the second day's hatching are mixed with them the latter are not ready to moult, and require feeding. To do this disturbs the former and endangers the successful operation of laying off the old garment, and even endangers their lives. The same difficulty and danger will occur at each several moulting. *Hence the great necessity of keeping them separate. This is one of the necessities that must be done.*

Now we will go back and attend to those little fellows that we took from the papers containing the eggs and placed upon other papers, and attend to their wants. Their first and almost only want is food. There

is one thing, however, of almost as much importance to their healthy existence that they *do not* want, and that is they do not want to be too crowded or thick together. For the first few days they require to be fed on the most tender leaves, which should be given to them directly from the tree, perfectly fresh and only a few at a time, removing them as often at those last given them are consumed. As the worms grow older and stronger, give them older and stronger leaves. But this rule should always be most faithfully adhered to: *Feed them but few at a time, renewing them as often as those last given them are consumed.* If this rule be strictly followed, you will never see wilted or dried leaves, but always fresh ones, before the worms. There is but one exception to this rule of fresh leaves, and that occurs on the days of moulting, when, as before remarked, they should have none. There is no absolute invariable rule as to the exact age when the several moultings occur, for the reason that the life of the worm, from the day of hatching to the spinning of cocoons, depends in a great degree on the favorableness and uniformity of the weather, and the frequency and regularity of feeding with fresh food and the quiet allowed them while moulting. The different varieties of worms also vary as to the period of their whole lives as well as to the time between each moulting. As a general rule, however, under favorable circumstances the several moultings will occur about as follows: The first moulting when five days old; the second when nine days old; the third when fifteen days old; the fourth when twenty-two days old. Whenever the worm is about to commence moulting, he leaves off eating, attaches himself rigidly to the most handy thing he finds and stretches up his head as if in pain. The fore part of his body increases and the latter part decreases in size, and the whole body assumes a glossy appearance. Thus he continues to swell up about the head until the old skin bursts and slips back towards his tail. He then crawls out of the old skin a changed being, looking shriveled and gaunt and hungry, and at once begins to look for his food. When care has been taken to keep only the worms of the same age together and they have been fed carefully and uniformly, all the worms on the same paper, or on the papers of the first day's hatching, will go though these several moultings at the same time. And so of the second and third days' hatching Thus when one worm wants to be quiet, and absolutely requires it, so does every other one on the same paper, and consequently all are gratified—no one crawling over or disturbing the other. Experience teaches that upon a proper separation of the several days' hatching depends, as much as upon any other one thing, the success of a feeding and consequent success of a crop of silk.

Next to proper care in feeding often and on fresh food, and keeping the worms of the same age together, it is important, as intimated above, that they should be properly thinned and spread out over greater surface as they grow larger. They should have room, so as not to be required to lay one upon the other too much. This is necessary both for convenience in getting at their food, and is very essential to the healthful growth and maturity of the worm. Besides the exercise of judgment, assisted by the appearance of the worms themselves, it may be well to be guided in thinning them out by the rules laid down in this article as to the space required for five hundred thousand worms in the several ages. To make this subject familiar, I will repeat here the space required for that number of worms, in connection with the amount of food they will require for consumption during each of the several ages:

Five hundred thousand worms for the first age should be allowed one hundred square feet of surface, and it is estimated that during this age or the first five days of their existence, they will consume one hundred and twenty-five pounds of leaves. During the second age, or the next four days of their lives, they should occupy about two hundred square feet of surface, and will consume three hundred and seventy-five pounds of leaves. During the third age—from nine to fifteen days old—they should occupy about four hundred and fifty feet of surface, and will consume eleven hundred and fifty pounds of leaves. During the fourth age —from fifteen to twenty-two days old—they should occupy one thousand one hundred feet of surface, and will consume three thousand four hundred and seventy-five pounds of leaves. During the fifth and last age—from twenty-two to thirty-two days old—the age of going to spinning—they should occupy two thousand five hundred square feet of surface, and will consume nineteen thousand eight hundred and seventy-five pounds, or about two thousand pounds or one ton per day—making in all about twenty-five thousand pounds or twelve and one half tons of leaves. It will be seen by the above statement that while the worms occupy but little space and eat but little during the first half of their lives, they spread out rapidly and eat voraciously during the last half. Consequently, while the work of feeding and attending to them is light during the first three ages, or first half of their existence, it becomes very considerable during the last two ages. These considerations have led, of late years, in most countries where to economize labor is desirable, to the adoption of what Mr Prevost styles the California mode of feeding. After the first two moultings, when the worms begin to move about pretty easily, instead of picking the leaves one by one from the tree and feeding them to the worms on a flat surface, you take your pruning shears and horse and wagon and go into your plantations, cultivated in dwarf form, as heretofore indicated, and in accordance with the plan approved by the Pioneer Silk Growers' Association, beginning at one side of the field and clipping off a portion of the straight shoots from each tree as you follow the rows back and forth, throw them by the armful into the wagon till you have gathered the required quantity for one feeding, and drive to the cocoonery. Taking an armful of these branches, you lay down four in the form of a square on each paper containing worms. The worms gather along the branches and devour the leaves from thence. The next feeding, you proceed in the same way, laying the branch each succeeding feeding on those before laid on; thus you build up a little square pen for each collection of worms all through your cocoonery. The worms work up from the stripped to the fresh branches, and in this way they are raised from the flat surface, where they are necessarily in contact with their own offal and filth, up into the air above it. This mode of feeding has many advantages, both in the manner of cultivating the mulberry tree in plantations as dwarfs, to which it has led, and in the feeding of the worms. First—You can gather the food much easier and faster. Second—You can produce much more to the acre than by the old orchard style of standard trees. Third —Leaves thus grown on trees pruned back are more vigorous and contain more of the resinous substance from which the silk vessels of the worm are filled. The advantages of this mode, as to feeding, may be stated as follows:

First—The greater facility of handling a given quantity of food.

Second—The greater length of time the leaves thus adhering to the branches will remain fresh.

Third—It gives the worms a freer circulation of air, keeps them clean and consequently more healthy and vigorous.

I have heretofore omitted speaking of the number of times worms should be fed during the twenty-four hours. Some say eight, some say ten, and so on, but I would lay down no absolute rule, but would say, keep some fresh food constantly within the easy reach of them all—night and day. Adapt the artificial feeding, as near as you can, to their mode of eating in a state of nature on the living and growing tree. In this, after all, is the great secret of success. Study to adapt every operation connected with the cocoonery, and the treatment and feeding of the worms, as near as you can, to their wild nature. Keep the building clean and sweet; let no other smell be perceptible but that of the fresh mulberry leaves; raise no dust; make no noises; move about quietly; give them their food carefully. Indeed, let them go through all their changes and transformations as though in the quiet recesses of their native forests, only protecting them from the excesses of nature which are injurious to them—such as exposure to the rays of the mid-day sun, to the storms of wind or rain, to the flashes of lightning or peals of thunder. Also protecting them from their natural enemies, such as birds, rats, mice and ants.

In moving the worms from one place to another in order to thin or spread them out, never touch or handle them. While feeding them with leaves, when you want to separate them, put on a few fresh leaves, and as soon as they are well covered with worms take hold of a leaf carefully, and lifting it up slowly lay it down on the place to which you wish to remove it. The same way when you want to remove all the worms from any given place or paper for the purpose of throwing out the litter—the stems and offal of the worms. This should be done at least every other day while feeding on the flat surface, with leaves. To separate them after they have commenced feeding with branches, move the branches lately put on while the worms, or a portion of them, adhere to them. And when you wish to throw out the litter and offal, take hold carefully, lifting up the pen or top portion of it; let another person empty off the litter into a basket or sack.

Immediately after the worms have fully finished moulting, they should all be removed from the place where they have deposited their skins, as these become very offensive and injurious to them.

SPINNING COCOONS.

When the worm is within three or four days of its spinning time it has acquired its greatest size and most ravenous appetite and formidable appearance. From this time until it begins its cocoon it seems to lose its appetite and diminish in size and weight. It also from that gradually changes its color from a rank greenish white to a light pearly yellow, and generally to assume the appearance of maturity. The last three or four hours before going to spinning it becomes in a degree translucent, and its skin about the neck becomes somewhat wrinkled. It becomes restless and uneasy, frequently raising its head as if to reach something; and if it eats at all at this time it does so daintily, as if feeding on dessert. These signs admonish the keeper to prepare for the harvest—if not a golden, certainly a silken harvest. At this stage the

worm begins to hunt some nook or corner out of sight, in which to wind its body in a silken shroud, and the sooner it can find a suitable place to suspend or fasten its cocoon the more perfect and complete that cocoon will be made, and the more valuable will be the harvest to be gathered. Hence it is very important good provision be promptly supplied in which the worms can all spin their cocoons. Many plans for this purpose have been invented. The best—or such as combine the qualities of economy, cleanliness and adaptation to the seeming fancy or real wants of the worm—should be adopted. Common wild mustard, cut just before the maturity of the seed, and the branches brought together and tied at the top, and laid between or set up inside the pens of branches on which the worms have been feeding, is very good. Also boughs of willow, or any other small and bushy twigs, similarly prepared, may be used; but clean wheat straw, cut of good length and tied up at each end, in bunches of three or four inches in diameter, and then pressed longitudinally so as to make a bulge in the centre of the bunch, is about the best plan for this country, as it can be obtained everywhere, and the worms seem to like it as well as anything. It has this advantage, that the cocoons are easily gathered from it, and with very little loss of floss silk—no dirt adhering to the cocoons.

After the worm commences the cocoon it must not in any manner be disturbed, and if allowed to proceed unmolested it will finish in from three to five days. In from six to eight days after the cocoons are formed they should be gathered, and all except those selected for hatching must be exposed for three or four days to the direct rays of the sun, to kill the chrysalis within. It will be well to expose them longer, so as to be sure to completely dry up or evaporate the fluids or moist substances of the chrysalis—otherwise there is danger of injuring the silk by staining it with the putrid matter of the chrysalis. It is also important that this chysalis be thoroughly dried, to prevent the bad smell that would otherwise be emitted from the cocoons when stored away, and also to prevent their heating. If you are prepared to reel the cocoons at home, this work may be now commenced; or if the cocoons are to be sold they are now ready for market. But in any event it must be rememberered that mice will destroy the cocoons if not kept out of their reach. So fond are mice of the chrysalis that one mouse in a very short time will destroy hundreds of dollars worth of cocoons.

PRODUCING EGGS.

Before exposing the cocoons to the sun, if it be desired to save any eggs for the reproduction of the worms, cocoons must be selected for this purpose and placed in any convenient place for hatching out the moth or miller. In order that the size and vigor of the worm may be continued or improved from generation to generation, it is important that only the very best cocoons should be chosen for propagating the species. Select the largest and most regularly formed, and as near as may be an equal number of male and female. The cocoon from which a male moth will hatch is generally smaller than that containing the female, and is depressed in the middle and more pointed at each end, while that of the female is more oval or egg shaped, and blunt at each end. All the floss or loose silk should be carefully stripped from the cocoons thus selected, that it may not entangle the moths when they come out. If the weather is warm and favorable, the moth eats its way out of the cocoon in about twelve days after it is completed.

Immediately after emerging, the male seeks the female for the purpose of pairing. And as the reproducing qualities of the eggs from which which you are to propagate the species depends entirely on the operation, it becomes important that every female be paired with a male, and the sooner this is done after she comes out of the cocoon the better, as the more sure will she be to become properly impregnated. If left alone, there being a large number of males and females all mixed promiscuously together, it is not probable that more than two thirds of the females will be properly paired with a male, and hence a large number of your eggs would be valueless. Here, then, is work necessary to be done, and done thoroughly and at the proper time. The moths generally come out of the cocoons in the morning before nine o'clock each day, in about the same order that the worms commence spinning cocoons. Hence, when you see the first moths, you must make it a regular stated business to be on hand about half-past eight each morning, and first pick out all the moths that are coupled, by taking carefully hold of the wings of each and lay them one side on a paper, being careful not to separate them. When you have removed all that are coupled, pair each female not already paired with a male, and lay them one side in like manner. When they have remained together about six hours, you must just as punctually be on hand and separate them. Taking hold of the wings of the male with one hand and those of the female with the other, pull them slowly and carefully apart. You have no further use for the male unless, as sometimes is the case, there should be a greater number of females the next morning than males. To meet such a contingency it is prudent to keep some of them over by putting them in a box, which cover over to keep them in, giving them plenty of air. Lay the females on soft paper of uniform size and thickness, such as you want them to deposit their eggs upon. Very soon after being separated from the male the female exudes a drop of yellowish matter, which will stain the paper, and in order to have your cards of eggs look clean and tidy, it is well to keep a sort of common blotter, on which all the females may be laid until they have freed themselves of this filthy substance, and then remove them to the egg card. This having been done, the female commences her last act—depositing her eggs. They lay on an average about three hundred apiece, and they will lay nearly all of these between the time of separating, say at two o'clock P. M. and dusk. The eggs laid during this period are generally considered the best and most vigorous, and that they may be kept separate it is well at this time to transfer all the females to other cards on which to deposit the balance of their eggs. Mark the first cards No. 1, and the cards on which the moths lay the balance of their eggs mark No. 2; and if your worms be of the annual variety, or if they be of the trivoltine variety, and you do not want to produce another crop of worms the same season, lay them into a box, which you with care fasten up so as to keep the mice out, and put them in a dry, cool place to Winter over. If they be of the trivoltine variety it is safest to put them in an ice-house, especially if it be not as late in the Fall as October. This variety will not generally hatch later than this month. A tin or zinc box, peforated with holes so as to give the eggs plenty of air, is the best. This same routine of pairing and separating the moths and securing the eggs must be gone through with each day, until all the moths have come out of the cocoons and laid their eggs. Having performed these last acts and left their eggs behind them for the propagation of their species, having, as it were, outlived their usefulness, the moths, both male and female, die a natural death. If

your worms are of the trivoltine or polyvoltine variety and you wish to produce another crop of silk in the same season—and in this State three crops in a season may successfully be raised—you have but to let your eggs remain in a warm place, and in about eight days they will hatch, and you can conduct the worms through the same process again and reap another harvest of cocoons. I should have mentioned that the room in which the moths come out of the cocoons, are paired and lay their eggs, should be kept somewhat dark; especially should it be dark while the moths are paired, or they will become separated before the proper time. The male moth is of a darker color, smaller and more active than the female.

SHADE TREES.

THE DESTRUCTION OF FORESTS AND THE CULTIVATION OF SHADE TREES.

BY I. N. HOAG, OF YOLO.

But few subjects are regarded with greater solicitude by the thinking men and political economists of nearly all the civilized countries of the present day than the wanton destruction of forests and the indifference and thoughtlessness of the people as to any plan for renewing them by artificial cultivation. In many of the European countries, the effect of this destruction has been perfectly disastrous, causing barrenness and desolation where once the earth teemed with abundance and plenty. The destruction of the forests has been followed, in many instances, by a forced desertion of large tracts of country by man and all domestic animals, to be occupied only by the natural inhabitants of deserts and wild, unproductive regions. This subject is already attracting the thoughtful and sagacious men of the Atlantic States, who see and feel those certain and unvarying changes taking place there which have never failed, in any country, to follow so unwise a practice.

The late President of the New York State Agricultural Society, Marsena R. Patrick, in an able address delivered before that Society not long since, in speaking of this subject, held the following very appropriate language:

"Has the wholesale destruction of our forests nothing to do with this sweeping over and beyond us of the heavy rain clouds? Can we continue to sweep away all our growth of timber in every arable district, and even denude our rocky hillsides and mountain tops without incurring the penalty? Can we expect to escape the operations of a universal law, that has produced uniform results in all countries and in all ages? Wherever this law has been violated, sooner or later, the lands have become desolate and the cities have perished. Palestine and Syria, Egypt and Italy, and Spain, and even France, have seen their most fer-

tile and prosperous regions turned into forsaken wilderness, and their most productive lands into arid, sandy deserts.

"Even the short reign of our boasted Yankee enterprise on the Pacific Coast has dried up many of the streams that found their sources high up those western slopes. Some of those slopes and mountain tops have already been stripped of their leafy covering; and so little rain now falls in certain localities on our western coast that crops can scarcely be grown, where fifteen years ago the earth was fairly burdened with the weight of its harvest.

"The statistics of the pump trade, where followed up (in States west of our own, especially), show a gradual increase in the length of tubing, requiring in Central Illinois an addition of nine feet within the last ten years, and in other localities nearly or quite as large an increase. Why there should be such universal apathy on this all-important subject I cannot understand, when the statistics of the lumber trade, and of the number of acres brought under cultivation from forests, are laid before the people every year; statistics which show us conclusively that at present rates of clearing up our lands, the next ten years will sweep off all the valuable timber of this State, except what is found in the great north woods, and the most of that is of inferior quality. Legislation should be invoked, before it be too late, to preserve that forest at least, and thus save Central and Western New York from the entire change of climate that must follow the opening up of the Adirondac Mountains region, making a pathway for the winds and storms from Labrador and the northeast to burst upon us in all their unchecked fury."

New York, within the memory of the present generation of her people, was almost an interminable forest. She is also surrounded by States which but thirty or forty years ago were nearly covered with dense and valuable timber. Timbered land and heavily timbered land through all that region of country was the rule, and the almost universal rule—prairie land being so scarce that those who had never travelled beyond that section of country scarcely knew what a prairie meant. The writer of this article, who is a native of Central New York, well remembers that he had no conception of a prairie until he visited some of the Western States. So firmly impressed was he that forest was the normal condition of a new country that he found it hard to be convinced that Pigeon Prairie and White Prairie, in the central portion of the State of Michigan, had not one day, and not further back than the settlement of the State by the whites, like the surrounding country, been covered with timber. To realize that prairie or untimbered land could be a natural condition of a country, he had to see and travel over the almost illimitable prairies of Illinois. Now, what I would ask and what I would impress upon the people of California is this: If New York, which has naturally a moist climate, is so soon beginning to experience the deleterious effects of a destruction of her forests, what will California be thirty years from now, if her people go on as they have for the past fifteen years, recklessly sweeping every vestige of timber before them as they settle up the country, or even in advance of settling the country? Our dry and rainless Summers, our sweeping north winds, greedily licking up all moisture from the earth, and sponging and carrying away the water of our mountain streams and valley creeks and rivulets in their midway courses to the larger rivers, admonish us, in terms not to be mistaken, that instead of the destruction of forests we should be most earnestly engaged in their cultivation.

As a direct result of the diminishing process that has been and is now going on in the Sierra Nevada and Coast Range districts, the enormous depths of snow that accumulate in the Winter seasons being exposed to the uninterrupted rays of the Spring sun, are melted and precipitated in rapid torrents upon and over the vast valleys below, carrying with them destruction of life and property, and rendering almost uninhabitable a country which for natural productiveness is not excelled by any other equal portion of the world. Then follows, as the more indirect but not less certain or less baneful result of this destroying process, the dry and parching Summer weather hastening forward to usurp the place and cut short the balmy and growing season of Spring, often even checking the germination of the seed which the husbandman has sown upon the soil as the water receded, and upon the growth and perfection of which that husbandman, his family and a multitude of non-producing industries depend for their food. Such are some of the results that we in California are already bringing upon ourselves by the wanton destruction of our forests, to say nothing of many others scarcely less striking and deleterious. At the very beginning of our necessities for lumber for carrying on the ordinary occupations of civilized life and improving and building up the business of the country, we begin to feel its urgent and inconvenient necessity, and find ourselves, naturally enough, studying and contriving to dispense with its use whenever it is possible. Hence the proposition to dispense with fencing our farms throughout the agricultural districts of the State. The time is not far distant, unless we adopt some plan not only to prevent the destruction of our timber but to renew our forests by artificial cultivation, when we shall be compelled by necessity universally to accept the no-fence system.

It is high time that legislative action was had in both instances—in the former by the imposition of fines and penalties, and in the latter by the offering of premiums and bounties.

Our last Legislature, recognizing to some extent the necessity of doing something in the premises, passed the following law.

This Act is of so much and general importance that we give it in full, hoping that the Boards of Supervisors in all the agricultural counties of the State will at once act upon and adopt it, and that the people will avail themselves of its provisions, and thus to some extent check the force and effect of the sweeping and destructive winds across the farming districts, and beautify and render more attractive and valuable their chosen homes. We are well convinced that long before any of the premiums under the law would become due, the property in any county that shall adopt the law, and the people generally plant shade trees on the highways, will, in consequence of such action, increase in value enough to more than meet the additional income required without any change of per cent. of taxation.

It is true that so few trees as would line all the roads in the State on both sides could have but little effect upon the climate, but they will to a great extent break the force of the winds and protect growing crops. They will also change the entire face of many portions of the State—from a monotonous, brown and dreary and uninviting landscape, to one of life and beauty. Particularly will this be noticeable in the latter part of the season, when the harvests have been gathered and nothing green is left on the land to relieve and please the eye. Our richest and most productive grain-growing sections at that time present the sameness and barrenness of aspect that reminds one of a parched and barren desert.

These green trees, marking the courses of the public roads, will then be an oasis in the desert, and will be equally appreciated and admired.

The following is a full copy of the law:

AN ACT TO ENCOURAGE THE PLANTING AND CULTIVATION OF SHADE AND FRUIT TREES UPON THE PUBLIC ROADS AND HIGHWAYS OF THE STATE.

SECTION 1. The Board of Supervisors of any county of this State may, by an order of such Board, to be passed at a regular meeting of such Board and to be entered on the minutes thereof, authorize the planting and cultivation of shade and fruit trees, by persons owning lands in such county, upon the public roads and highways adjacent to such lands.

SEC. 2. The Board of Supervisors may, by order entered upon their minutes, designate the roads or highways upon which such trees may be planted, so describing such roads by reference to places and boundaries that the same may be readily ascertained. They shall also in such order direct the species of trees to be so planted, their age when planted, their distance from each other, and their position with reference to the travelled road, and also all such other rules and regulations as they shall deem proper to secure the proper planting, growth and protection of such trees, and also to prevent their obstructing the travel upon such road.

SEC. 3. Whenever any person shall plant upon any public road, in front of land owned by him, shade or fruit trees in accordance with the provisions of this Act, and also of such rules as the Board of Supervisors may prescribe hereunder, such person so planting such trees shall file with the Board of Supervisors of such county a written statement, setting forth therein the road or places upon which such trees are planted, the number and species of trees thus planted and the time of planting.

SEC. 4. Four years from and after the time of planting such trees and giving the notice as provided in section third, the person planting such trees, or his legal representatives, may present to the Board of Supervisors of such county his statement in writing, verified by the oath of such applicant, setting forth therein the number and species of trees originally planted, when and by whom planted or caused to be planted, and the number then living and in a thrifty condition; and for any willful misstatement contained in such report the party making the same may be prosecuted for the crime of perjury.

SEC. 5. Upon filing such verified statement, the Board of Supervisors of such county shall allow to the party making the same the sum of one dollar for each and every tree so planted and growing thriftily, the same to be audited and paid out of the General Fund of such county, as other claims are allowed, audited and paid.

SEC. 6. Nothing contained in this Act shall be construed to apply to any trees planted before the passage of this Act, or unless planted and cultivated as required by the orders of the Board of Supervisors.

SEC. 7. This Act shall be in force from and after its passage.

KINDS OF TREES TO PLANT.

In selecting the varieties of trees to be planted in the different localities in the State, of course some reference should be had to the different characteristics of the climate and soil, and the adaptability of the differ-

ent kinds of trees to the same. While there are some kinds of trees that will grow well and in a few years make beautiful and ornamental as well as valuable trees in almost any locality or kind of soil in the State, there are others that will succeed only in localities and soils to which they are particularly and exclusively adapted. The sycamore and Lombardy poplar, for instance, will grow very rapidly and make most magnificent trees along our river bottoms, but would be of little account on the back or table lands of the great valleys of the State. The different varieties of pines make very pretty trees wherever grown, but their slow growth and the difficulty of making them live after transplanting is decidedly against them. The locust is a beautiful tree for shade and valuable for timber, and will grow well in most localities and soils, but does not stand well the overflows of our river bottoms; while the black walnut is very nearly as handsome a tree and is alike a native of our mountains and our lowest river bottoms. I never saw one die from the effects of floods.

The different varieties of the mulberry tree perhaps cannot be excelled in their adaptability to all the localities and soils of our State. They will stand water equal to the willow, and from their habit of throwing deep down into the soil a strong tap-root, they will flourish and grow rapidly in the dryest localities. There is no tree, to my knowledge, so tenacious of life and such a rapid grower in all varieties of soil and climate as the mulberry. In addition to these very valuable qualities they may be rendered very useful and profitable by converting their leaves into silk. For ornament and beauty, also, the Morus Alba and Morus Morretti are very seldom equalled, making a strong and vigorous tree of from forty to fifty or more feet high, with a beautiful compact pyramidal top of dark green foliage. The timber of these varieties is also valuable for the same uses and purposes as the timber of the locust, which it very much resembles in compactness, color and general appearance.

The Morus Multicaulis would not be so valuable as the above varieties for shade trees, being a more slender grower, and likely, from its heavy foliage, to be broken by the winds when allowed to grow high, as a standard tree. It has many of the habits of the dwarf, nor is it so compact and symmetrical in form as the others, or so valuable for timber, being of a softer texture. Were the mulberry trees to be generally adopted and planted throughout the State as shade trees under the above law, it is believed that in addition to the enhancement of the value of the real property, so that the additional taxes would pay the premium on the trees, arising from the beautiful and general prosperous and comfortable air given to the country, the silk that could be made from the leaves of the trees so planted would of itself be of sufficient value, so that the leaves thereon would equal the value of the premiums or bounties to be paid by the counties.

The cottonwood and elm trees are also favorites as shade trees. The former, like the mulberry, will grow in all localities, on high or low lands, and will stand the water of our floods equally well. It is, however, of no value for timber, and when from six to eight years old, bears great quantities of cotton, which makes it a very dirty and undesirable tree about a dwelling. It also sheds a sticky substance in the Fall of the year, which is very unpleasant. The elm is a beautiful tree and rapid grower on the low river bottoms in this country, but will not do well on the higher lands.

TRANSPLANTING SHADE TREES.

A tree, to make a rapid growth and preserve its natural form, must not be deprived of its naturally formed roots. Trees that grow from the seed without transplanting, as in the forests, mostly send down a principal root, called a tap root. If you would secure in a shade tree the natural characteristics of form and growth, this root should not be cut off in transplanting. Then, again, different kinds of trees require to be planted differently. The hole into which the roots are to be placed should in all cases be made much larger and deeper than would be sufficient to put in the roots, in order to loosen up the soil, and then, instead of covering the roots with the same soil taken out, fine surface soil should be used for that purpose. This soil, from its exposure to the sun, has been fitted and prepared to yield the proper nutriment to the roots.

As a general rule, trees should be planted the same depth in the ground that they originally grew. It is better, however, that all trees of a soft bark and that may be propagated from cuttings—such as the mulberry, the cottonwood and Lombardy poplar—should be planted somewhat deeper than they were before digging. This induces them to throw out new and vigorous surface roots, and adds new life and vigor to the tree. It has the same effect as the deposit of sediment by the Spring floods. This very quality or susceptibility of being propagated from slips or cuttings is a proof that the tree will stand water, and may be cultivated on the river bottoms where the land is subject to overflow. It is also a proof that the tree is very tenacious of life and that the roots will absorb sufficient moisture from almost any soil to support life and make rapid growth. If water cannot be had in sufficient quantities near by, the roots of this class of trees will seek it at a distance, either by sending roots deep down or by throwing out roots along the surface until a damp place is reached, or by adopting both plans. I have known cottonwoods to send out small fibrous roots along the surface for fifty feet in the direction of a well, and, having reached it, descend to the water's edge, and there form a thick mat of roots, so as to choke up the whole well and prevent the drawing of water from it. Trees of such habits, so persevering in obtaining the necessary support of life, may be depended on to grow and do well in almost any locality in the State, and they may be planted at almost any depth in the ground without injury. The mulberry is of this character, and taking into account all its good qualities, I would place it first on the list for a shade tree.

COUNTY AGRICULTURAL SOCIETIES.

The State Board of Agriculture have long since recognized the importance of co-operative industrial societies in the different localities of the State, and in their annual report and otherwise have called the attention of the public to the matter and urged their formation. In January, eighteen hundred and sixty-seven, the Secretary of the Board issued a special circular and sent it to the leading farmers in all the counties of the State; and as the arguments are as applicable now as then, we republish it, in hopes that at this particular time, when agriculture is assuming so important a position among the industries of the State, it may wake up the agriculturists to the importance of such organizations. We also append a copy of a bill to encourage the formation of such societies, prepared by the Secretary, which passed both houses of the Legislature, but, failing to receive the signature of the Governor, did not become a law.

In our opinion, if the bill had become a law, it would have proved a most valuable law, and would have been the means of stimulating the development of the resources of the State very materially. No more auspicious time for the State to lend her influence and aid to the organization of such societies could have been chosen, and we regard it as a great misfortune that the Governor did not look upon the matter with the same enlightened views as did the members of the Legislature.

We hope the next Legislature will pass a similar or the same bill, and that the same may yet become a law. If once such a liberal and enlightened practice as the appropriation of money annually to all the county societies that may be formed in the State be inaugurated, we have no fears that it will again be abandoned. Our advice to farmers of the several counties is, to organize at once and hold Fairs and meetings for discussion and improvement in agricultural practices, and see to it that the next members elected to represent their counties in the Legislature be fully imbued with the spirit of improvement and encouragement of industrial associations. It is much more important that a legislator understand the material interests and wants of the several counties of the State than that he belong to any particular political party.

Politics have but little to do with the industrial prosperity of a great commonwealth like ours. Good business ability and capacity are the qualities necessary in a law-maker of California. No calling or indus-

trial pursuit in the State, I am compelled to state, has been so poorly represented in the California Legislature in the past as agriculture, in all its various branches. Not that the representatives from the agricultural counties have not been men of ability, but their rural habits render them too modest to demand and secure the rights and wants of their constituents, especially if appropriations from the State Treasury are involved. The members from the towns and cities, being more accustomed to seeing the expenditure of public moneys for public improvements, have less scruples at asking State aid for the advancement of any enterprise their constituents desire to engage in, and the very lavishness with which they call for and obtain assistance resolves the members from the agricultural districts to the more rigid practice for their constituents of self-denial and public economy. Economy is a very good thing in its place; but to practice economy and stinginess at the sacrifice of the prosperity of the producing industries of the country, and use the money oppressingly wrung from these industries for other and less worthy objects, is very poor economy for any State or people to practice. Since my connection with the State Agricultural Society, I have had a good deal of experience in the legislation for the industries, and I have often remarked that farmers themselves are less liberal in the encouragement of agricultural industries than the representatives of most any other class. Hence where appropriations are sought for the encouragement of any industry, however necessary and worthy, the friends of the measure generally prefer that it should be referred to most any other Committee than that on agriculture. This should not be the case, and we hope, in the future, will not be. Let the agricultural counties send to the Legislature their most active and enlightened men—men who can and will realize that they represent the most important interest in the State, and that for the State to encourage that interest judiciously is but loaning the people's money to the people, who will return it in a very short time with ten fold interest added. No other industrial enterprises can, with so much safety and so much prudence, be helped as those of agriculture:

MEMORIAL.

ROOMS CALIFORNIA STATE BOARD OF AGRICULTURE,
SACRAMENTO, January, 1867.

To the People of the several Counties of California:

Agriculture in California seems at last to be assuming that relative position among the other industries of the State to which its importance entitles it. California is becoming a steady exporter of a large number of agricultural products; her grains, her wines and her wools are quoted in the principal commercial marts of the world, and her farmers must henceforth look to other States and other countries for a market for the surplus products of their farms, orchards, vineyards, flocks and herds. Hence it is of the first importance to our farmers that they make themselves familiar, not only with the productions of their own State, and with our home markets, but also with the productions and markets of those countries for the supply of which their surplus may be demanded. It is only through seasonable and reliable information in regard to these matters that farmers can protect themselves against imposition and loss, and secure a fair price for their produce, graduated upon the real supply and demand. The channel or medium through

which such information may be obtained—to be reliable—should be created and controlled by the farmers themselves. Systematic organization, for the collection and distribution of such information, would seem to be the proper means to be adopted. Then, again, agriculture in this State is but in its infancy; much is yet to be learned in regard to its practice in every department. This can only be done by individual experience, or by association—by mutual intercourse and interchange of experience among those interested. Such interchange and intercourse would contribute very much to individual prosperity, and to the prosperity of the farmers of the State as a class. Here, too, is a motive, and a strong one, for organization.

As things now stand, our farmers are working entirely in the dark. The reports and figures of our commercial papers, though good and useful, and almost indispensable to the merchant and dealer, are of very little account to the producer, for the very plain reason that these reports and figures only give information in regard to the produce of the country after it has left the hands of the latter and is owned and handled by the former. Efforts have been made by our Legislature to provide for the collection of the statistics of our annual crops, through the County and District Assessors, but such efforts have heretofore proved but disgraceful failures, doing our State much more injury than good—for the reasons, that while professing to be correct and full, these statistics are, in fact, very incorrect and partial. As they have been, they will probably continue to be in the future, though it is hoped they may be improved. But even if such efforts were to succeed, and reliable information should thus be gathered, such information could result in no direct advantage to the farmer, for the same reason which renders the commercial transactions and figures of little value to him. They will be gathered and published a long time after his produce has passed out of his hands, and can therefore form no guide to his judgment in the disposal of his crops. What the farmer wants is a system that will enable him to gain a knowledge of the varieties, quantities and conditions of the crops throughout the State, when they are put into the ground; and one that will keep him posted as to their appearance and promise from that time until they are harvested, measured and ready for market. Such a system should, as much as practical, embrace those countries for the supply of which such crops may be demanded for export. The merchant and importer of San Francisco keeps constantly before him a list of goods on hand and to arrive, and acts accordingly. The farmer should keep as constantly before him a list of produce on hand and to be raised, and he should act accordingly. Until he does so, the farmer is at the mercy of the world and its multitude of sharp, unscrupulous tradesmen, instead of being the independent man he might make himself.

An organization for the accomplishment of the objects above set forth may be so formed as at the same time, by intercommunication and exchange of thoughts and modes of culture, serve to improve agricultural practices and increase very greatly agricultural products. Merchants and mechanics are generally collected together in the towns and cities in constant association, and learning one from the other—thus, in their cases, enjoying all the facilities for observation and improvement they can desire. On the contrary, farmers are isolated one from the other, and to a great measure each is dependent for new ideas and new improvements in his business upon his individual experience. Hence it is that improvements in agriculture have always lagged behind those of all other occupations and trades, and hence the greater reason for asso-

ciations and organizations for bringing the farmers together at frequent and stated periods. Hence the necessity for Agricultural Societies and Fairs, at which the best products of the farm, the dairy, the orchard, the vineyard, and of the flocks and herds, may be exhibited, and the different modes of cultivation and production discussed.

To bring the benefits of such societies home to all the people of a great State like ours, a single society at any one point must fall far short of the objects desired. Every county, at least, should have its organization, which should hold its stated meetings and its annual Fairs. To accomplish more completely the general benefit, these county organizations should be auxiliary to and be in frequent communication with a central society. They should each collect statistics and general agricultural and industrial information—such as the quantity and state of the various crops within their borders, and should report at stated times, say monthly, to the central society, to be compiled by it and put in convenient tabular form and returned for general distribution.

The annual Fairs of the county societies should all be held just previous to that of the central society, and from the best of the articles exhibited at such Fairs should be selected those to represent the county at the Fair of the central society. The officers of such county societies should be ex officio members of the central society, and their annual report should become a part of the report of the central society to the Legislature and to the public. Each county society so organized and so reporting should receive a proper proportion of an annual appropriation from the State. To make such plan more complete, comprehensive and useful it should embrace within its objects every industry of the State—agricultural, manufacturing and mining. The beneficial effects of such an organization upon the industry and prosperity of the State would be incalculable; its importance will be acknowledged by all.

With a view of putting in operation such an organization, and of eventually accomplishing the objects above set forth, the State Board of Agriculture appeal to the people in every county in the State to meet together as soon as convenient, and form themselves into societies as above indicated; when so organized to report to the Secretary of this Board the name of the organization and the name and address of each of its officers. For the sake of convenience and uniformity, each society might elect a Board of (say nine) Directors, properly distributed over the county, to whom should be intrusted the general management of the society, and the collection and distribution of the information desired. From these might be selected, near a central locality, a President, Secretary and Treasurer, to constitute an Executive Committee, to carry out the general plans of the Board, and for correspondence.

Whenever the State Board of Agriculture shall receive notice of such organization, and a desire for such co-operation from twenty-four counties of this State, they will elect the officers of such societies members of the State Society, and will put into immediate operation the necessary machinery for accomplishing the objects above indicated. They are already in such communication as will enable them to receive and distribute monthly the necessary statistics from most of the States of the Union. If the people of the several counties will act at once, the benefits of such an organization may be secured to them this season. Will you do it?

Direct any communication to the undersigned, at Sacramento.

By order.

I. N. HOAG,
Secretary.

AN ACT FOR THE ENCOURAGEMENT OF AGRICULTURAL SOCIETIES IN THIS STATE.

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. There is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the sum of five hundred dollars annually, for the years eighteen hundred and sixty-eight and eighteen hundred and sixty-nine, for the use of each County Agricultural Society now organized, or that may be organized within this State in either of such years, to be paid to each of such societies upon the following conditions and in the following manner, namely: When any County Society shall have completed its organization and elected its officers, adopted and published a premium list offering premiums for the various agricultural, horticultural, mineral, mechanical and other industrial products of the county, and shall have raised, by subscription or otherwise, a sum not less than one thousand dollars—shall have held a Fair and paid out in premiums, either in money or other articles, the amount last named—then any such society shall be entitled to the sum of five hundred dollars from the State Treasury, as above appropriated.

SEC. 2. Upon an affidavit, signed and properly attested by the President and Secretary of any such society, that all the conditions named in the last section have been fully and in good faith complied with, naming each condition specifically, being filed with the Controller of the State, then the Controller shall draw his warrant on the State Treasurer for the sum of five hundred dollars, in favor of the Treasurer of such County Society, and the Treasurer shall pay the same.

SEC. 3. The Directors of each County Society now organized, or to be organized and to claim the above appropriations, shall each year report to the State Board of Agriculture the names and Post Office address of each officer of such society, on or before the first day of July, and on or before the first day of December of each year they shall report to said Board the transactions of such society, including a list of articles exhibited and premiums awarded, the amount of receipts and expenditures of the year, the new industries inaugurated and new products produced, and any and all other facts showing the development of the resources of the county which they may deem worthy of such report. The reports so received, or so much thereof as may be deemed important, shall be included in the report of the State Board of Agriculture to the Governor. The President, Secretary and Treasurer of all the societies complying with the conditions above enumerated shall be ex officio members of the State Agricultural Society, and entitled to all the privileges of annual members.

SEC. 4. Any number of counties less than five lying contiguous to each other, in none of which there is or shall be within the years above named a County Agricultural Society organized, may unite together in the organization of a District Agricultural Society; and upon complying with all the conditions in this Act imposed upon County Societies, and particularly that of raising and paying in premiums a sum equal to one thousand dollars for each county uniting in the formation of such District Society, shall be entitled to, and shall receive from the State Treas-

urer a sum equal to five hundred dollars for each county so uniting to form said District Society, the same to be drawn and paid in the same manner as to County Societies.

SEC. 5. This Act shall take effect and be in force from and after its passage.

CALIFORNIA—HER AGRICULTURAL RESOURCES.

ORIGINALLY WRITTEN FOR THE COMMISSIONER OF AGRICULTURE,

BY H. D. DUNN, SAN FRANCISCO.

The agricultural resources of California are of such magnitude, of so varied a nature, and when properly developed will be so valuable, not only to the States and Territories lying contiguous on the Pacific slope, but to the United States as a nation, that it seems strange that a more general knowledge of the same has not been heretofore attained by the American people. Settled originally, on the part of the Americans, by a few pioneers whose frontier habits of life were of a wandering nature, the vast mines of agricultural wealth contained in the soil (other than those partially developed at the Missions) were overlooked, and the country, aside from occasional river bottoms and a few small valleys on the coast, was deemed sterile and unsuitable for culture. Walled in between the Sierra Nevadas and the Coast Range of mountains, the great interior valleys and plains producing immense quantities of wild oats and indigenous grasses, were valued only for the purpose of cattle raising, large numbers of the latter being slaughtered for their hides and tallow, which were sold to the few trading vessels that yearly visited the coast. At the Missions, the first of which had been located in seventeen hundred and sixty-nine and seventeen hundred and seventy, a few small tracts of arable land had been cultivated, the soil producing bounteously all the smaller cereals, while the grape, olive, fig, pomegranate and other semi-tropical fruits, brought by the priests from Mexico and Spain, flourished as if in their native soil. Such was the condition of California when war broke out between the United States and Mexico in eighteen hundred and forty-six, and such in great measure it continued to be until the necessities of a large mining population in eighteen hundred and forty-nine induced a more thorough and extensive search into the capabilities of her soil and climate. So ignorant were Californians of the agricultural resources of their State, as late as eighteen hundred and fifty-two, it was the general opinion of the people that, although immensely rich in minerals, it would always be impossible to support her

then existing population without importing the greater part of the necessaries of life; that while there were a few valleys of undoubted productiveness, a vast proportion of the soil outside of the mineral regions was only suitable for the production of indigenous grasses for the support of cattle. With this mistaken view of her capabilities, many thousands of people left the country after having been successful in mining. Other thousands preferred to live without their families and the comforts of home while gold digging, under the idea that the mines becoming soon worked out, with the staples of living imported, there would be no inducement to settle permanently in the State. These ideas were also propagated by returned adventurers in the Atlantic States and greatly deterred the immigration of families, who were much needed to form a valuable and settled population in the agricultural districts.

SOIL AND CLIMATE.

The State of California extends along the North Pacific from the thirty-second degree and twenty minutes to the forty-second degree north latitude, and from one hundred and fourteen degrees to one hundred and twenty-four degrees and thirty-three minutes west longitude. Its greatest length is about seven hundred and sixty miles, in a northwest and southeast direction, averaging about two hundred and sixty miles in width. A large portion of the country is mountainous or hilly, the great Sierra Nevada mountain range extending along its eastern boundary, and the Coast Range and kindred spur mountain ranges along the greater part of the western border on the shores of the Pacific. These two ranges of mountains connect by spurs in the north on the border of Oregon, in Siskiyou County, and again in the southern part of the State, near Santa Barbara County. Between these two mountain ranges lie the great Sacramento and San Joaquin Valleys, extending north and south for hundreds of miles, one valley being a virtual continuation of the other. These valleys are intersected by numerous streams which flow from the mountains, and combining form the Feather, Yuba, Sacramento, American, Stanislaus, Tuolumne, Calaveras, Merced, San Joaquin and other rivers. Some of these are navigable for light draught steamers at all seasons for hundreds of miles above their mouths. The Sierras along the foothills contain many small valleys, which produce abundant crops of cereals, but are more especially adapted to the cultivation of the grape, olive, almond and other kindred fruits. The Coast Range is also penetrated by numerous fertile valleys, some of them in the southern portion of the State being quite large.

California has virtually but two seasons, viz: the Summer, or dry season, and the Winter, or wet season. The former generally commences in April and continues until October, very little, if any, rain falling in the interval. The rain fall during the year varies somewhat in different localities; but throughout the State, in the few places where rain gauges were kept, the general average since eighteen hundred and fifty has been from ten to forty-nine inches. With a fall of but ten inches, the result is a drought that destroys the larger portion of all crops, and, as was the case in eighteen hundred and sixty-four, insures the destruction of from one third to one half of the cattle and sheep that range in the lower valleys of the State. The forty-nine inches, in the interior, where the land is low and level in vast tracts, produce immense floods, as in the Winter of eighteen hundred and sixty-one and eighteen hundred and sixty-two. A fall of twenty-two inches of rain insures a very

good harvest, while an excess of that quantity admits of the sowing of a greater breadth of land, which, with the fertilizing sediments deposited on the low lands, more than compensates for the damage done by floods to house, barn and fences.

The climate of California varies greatly in different places. To describe it properly, it is necessary to divide the State into districts, either of which possesses a climate that differs materially from the others. For this purpose I make four districts, and name them, viz: North coast, south coast, interior valleys and Sierra Nevada districts.

NORTH COAST DISTRICT.

The north coast district includes the coast valleys and mountain ranges north of Point Conception, and is on an average forty miles wide. Its proximity to the Pacific Ocean gives it a peculiar climate, the Winters being free from excessive cold, snow rarely falling on elevations of three thousand feet, or the temperature as low as thirty degrees Fahrenheit. Since eighteen hundred and fifty there have been quite a number of Winters when no snow has fallen, and there were only slight hoar frosts in December and January. The more hardy vegetables, such as the potato, cabbage, beet, turnip, cauliflower, parsnip, radish, etc., grow through the Winter, and are gathered in every month of the year. Strawberries ripen in the open air in March, and the first cherries sometimes as early as the middle of April. Barley has been cut in the latter part of the same month, but more generally about the fifteenth of May. The greater part of the first hay crop is gathered early in April, and wheat is cut in some favored localities by the fifteenth of May. The weather during Summer is comparatively cool, with occasional short heated terms, during which the thermometer ranges as high as from eighty to eighty-five, the nights, however, being pleasantly cool. The general temperature from April to November ranges from fifty-five to seventy degrees. From May to November this section of California is visited by strong northwest winds, which blow with great regularity from noon to sunset, when they die away, to be renewed next day. These winds are often attended by dense fogs, which prevail from 4 P. M. to 8 A. M. When these fogs first strike the coast they generally contain a great amount of moisture, and at times resemble a Scotch mist. This moisture is precipitated mostly on the hillsides and valleys next to the ocean, and keeps grass enough for feed until late into Autumn, making this section peculiarly valuable for stock and sheep raising, and for dairy purposes. The dampness, however injures the quality of wheat, barley and oats exposed to its influence, and they become less dry and of a deeper red or brown color than the same varieties of grain raised in the eastern valleys of the district and other portions of the State.

THE SOUTH COAST DISTRICT.

In this section the Winters are still milder than further north, frost rarely occurring, while snow is seldom if ever seen, except on the tops of the highest mountains. The orange, lemon, lime and citron are gathered from November to March, while green corn is to be had, where the ground is irrigated, from the first of May until Christmas. Generally, less rain falls in this district than in the others, but the total fall is distributed over a longer space of time, viz., from the first of October until May, a few showers falling, in some years, as late as July. In Summer

there are no strong northwest winds and no sea fogs, such as prevail further north, while the temperature is also more equable, and ranges from sixty to seventy-five degrees, with occasional light dry fogs. There are sometimes periods of what may properly be termed "burning" weather, which do considerable damage to vegetation in very dry seasons. These, however, come at very long intervals, four and five years sometimes intervening, and generally after the main crops have been harvested.

INTERIOR VALLEYS DISTRICT.

The Winters of this district are somewhat colder and of longer continuance than those of either of the foregoing sections. The strongest frost, however, rarely produces ice of the thickness of an eighth of an inch, and vegetation is seldom more than two weeks behind that of the north coast district, oranges ripening in the open air as late as February. There is, however, a noted difference in the dry season, Summer following close on the heels of Winter, a very short Spring intervening. The weather frequently attains its maximum heat about the middle of May, and continues sometimes, with slight intermission, until October. This heat, however, is devoid of moisture, and resembles more the air from a hot oven than the same degree of heat found in any of the Atlantic States. Although the thermometer frequently ranges as high as one hundred degrees, and in some portions of the valleys even to one hundred and thirteen and one hundred and fifteen degrees in the shade, the heat is borne by man and beast with less distress or danger than eighty-five degrees in the north coast district, or the same degree in the States east of the Mississippi River. In some portions of the Sacramento and San Joaquin Valleys the heat is greatly mitigated by the northwest winds of the coast, which come through gaps in the Coast Range Mountains. These winds lose their moisture in crossing the mountains, and are tempered, as it were, by heat in passing over the valleys. There is, therefore, little or no abatement of heat experienced when they strike the foot-hills of the Sierra Nevadas, which gives that portion of the district a steady and equable temperature that is in the highest degree favorable for the best development of the vine, which cannot be found in such perfection elsewhere. This peculiarity of climate promises, in a few years, when vineyard proprietors acquire proper experience in wine-making, to produce some of the finest qualities of wine known anywhere in the civilized world.

SIERRA NEVADA DISTRICT.

This district comprises the hillsides and numerous valleys in that range of mountains above the altitude of twelve hundred feet. The Winters are quite mild, although snow falls to a very great depth in places above three thousand feet elevation. These immense deposits of snow form the reservoirs of the numerous rivers that water the large valleys of the interior, and without which the former would become dry, or nearly so, during half of the Summer. These snows gradually melt during the Summer, but large quantities on the northern slopes of the highest peaks continue from year to year, and are seldom entirely dissolved during the seasons of greatest drought. The great fall of snow in Winter is unaccompanied by any severe degree of cold, it being quite difficult at times to obtain ice over an inch thick at elevations of about five thousand feet above the sea. The way ice of sufficient thickness is had in these regions

is by making ponds of water, in which a thin sheet of ice is formed; more water is then let on the surface of the ice and frozen, and the process is repeated until the thickness of the sheet is considered suitable to cut for consumption in the Summer season. The Sierra Nevadas really comprise two parallel ranges of mountains, with numerous narrow valleys lying between. These valleys are very fertile, producing wheat and potatoes up to an altitude of about six thousand feet. The crops, at that elevation, are sometimes cut off by late Spring and early Autumn frosts; but enough is generally produced of these staples to support, in part, quite a large population, while the grass lands are able to feed a much larger quantity of stock than will probably ever be needed for local consumption. During the Summer the climate of this district is probably the most pleasant in California. The days are temperately warm, and the nights cool enough to make a moderate quantity of bed clothing desirable. For months at a time there is an almost cloudless sky. The vegetation in the higher portions of this district is always green, presenting a most pleasant sight to travellers who have journeyed across the parched valleys of the interior. The agricultural products of this section are relatively of higher value than in the others, because of the proximity of mining settlements, which afford a ready market, at only a small expense for transportation.

It is difficult to describe properly the soil of California, which is excellent for grain growing everywhere, but varies greatly in appearance and composition in different portions of the State. All the valley lands which have been tried have proved well adapted to agricultural pursuits, and, so far as known, the bald hilltops, cultivated in very rainy seasons, have yielded fair crops of grain. In describing the climate of the different districts, I have given a description of the usual weather in ordinary seasons. Most of the sections described I have knowledge of from a personal experience of over seventeen years. That the Winters of California are very mild is self-proved by the semi-tropical fruits grown in the open air, such as the orange, lemon and citron, which ripen in the northern portions of the State in January and February. The advantages of such a climate over the severe frosts and snows of Winters in the Atlantic States and Northern Europe are thus at once apparent, and need no argument to convince an unbiased mind. The freedom from rain for six consecutive months in Summer admits of the cultivation of larger tracts of land in small grain, to each man employed, than in the Atlantic States, as the crops can, and often do, lie three months in the field after cutting, before they are threshed and housed ready for sale.

POPULATION.

The entire population of the State is estimated, by the best judges (in the absence of reliable census returns), at from four hundred thousand to five hundred thousand persons. Of these, there are about sixty thousand Chinese, who are engaged in mining and railroad building. The population of San Francisco is one hundred and thirty thousand; that of other towns in the State, not engaged in farming pursuits, say fifty thousand; and whites engaged in mining, teaming, commerce, milling and other kindred employments, fifty thousand more, making a total of two hundred and ninety thousand persons who are consumers and not producers. This leaves, at the highest estimate, about two hundred and ten thousand persons unaccounted for, who form our agricultural population. Deduct from this number the women and children,

and there are probably not one hundred thousand adults directly engaged in agricultural pursuits in California. With the comparatively small number of farmers, we are fast taking a high rank in the list of wool, wheat and barley growing States, while our production of wine this year exceeded that of all the other States of the Union combined. That the soil must be of an exceedingly fertile character, and the climate peculiarly favorable to agricultural pursuits, will be apparent when it is considered that this great interest has been virtually created since eighteen hundred and fifty-two. Up to that time not one tithe of the flour, barley and some other staples consumed were produced in the State; while for our fruit, sheep, hogs and poultry, we had to rely mainly upon importations from Oregon, the Hawaiian and other islands, and New Mexico. At the present time the home demand takes but a very small portion of some of the great staples produced, as California also supplies Nevada, Arizona, and portions of Utah and Montana Territories, besides exporting vast quantities of wheat, barley, oats, etc., by sea, to different portions of the globe. When we consider that such great results have been attained through the labor of a comparatively small population, and that at the present time not one tenth of the arable land in the State is under cultivation, the magnitude which the agricultural interests of California may assume, with a population sufficient to properly develop her resources, looms up with a grandeur greatly exceeding that of any other State in the Union. No other farming population in the Union have had to contend with the difficulties that have continually beset our people, and which have only within the last year or two been removed. Until within a comparatively short period, a settler could scarcely find a tract of fertile land unoccupied that was not claimed under an old grant from the Mexican Government. The boundaries of these grants being indefinite, and clouding the title to ten times the land called for, the settler had to risk what improvement he might put on the land to the mercy or caprice of the claimant of the grant. Under the ruling of our Courts, claimants had the power to dispossess all parties within the boundaries of which so small a portion of the land was granted, while awaiting survey. The grant having been nearly all definitely located and the public land surveyed, this condition, in respect to titles, has been changed, and parties wishing to settle on public lands, or to purchase of grant owners, can do so with a feeling of security not before known.

CEREALS.

In the production of some varieties of small grain, California has no rival in the other States of the Union, and, all the circumstances attending cultivation duly considered, no superior in the world. In the earlier years of grain growing, the average product of wheat was between sixty and seventy bushels to the acre, in favorable seasons. Instances were common where large fields of from sixty to one hundred acres averaged ninety to one hundred bushels, and selected acres as high as one hundred and twenty bushels. At the present time the average yield of wheat, *properly sowed* in ploughed land, is about forty bushels per acre. A slovenly system of cultivation has, however, been introduced in the State, which has been in great favor with farmers. The majority of cultivators throughout the State have pursued the following plan, which not only gives a very small return for the land cropped, but also exhausts its fertility at a rapid rate: The new land is generally scratched or broken up by ploughing from three to four inches deep. Grain is sown, say

wheat, which yields from forty to sixty bushels to the acre, if the season is a fair one. The crop having been garnered, cattle, horses, sheep or hogs are turned in on the stubble to fatten on the heads of grain that have been left or scattered by the reaper when cutting. When the feed gets poor the animals are removed, and the ground is harrowed with a light cultivator, but in a majority of instances by simply dragging brush over it. Our farmer now considers his field as sown, and awaits harvest time to reap the rewards of his labors. If the season is a fair one, the land produces probably twenty-five bushels of wheat. In many cases the process is renewed, and another but smaller crop harvested from the same ground, say from twelve to fifteen bushels, in the third year. This process of cropping the land is termed "volunteering," or "volunteer" crops. Under this system of culture the average yield of wheat throughout the State is reported by the County Assessors at about twenty bushels to the acre. Their reports, however, are grossly inaccurate in some known particulars, and in the case of wheat growing ("volunteer" crops included), from personal observation derived from widely scattered sources, I am inclined to believe that the true average crop of wheat in California, in favorable seasons, may be estimated at from twenty-five to twenty-eight bushels per acre. As a general rule, grain lands receive neither manure nor rest, the same ground being cropped with wheat for seven or more years continuously. A better system of cultivation is being inaugurated in some portions of the State by cropping one year and Summer fallowing the next. By this plan, land that did not produce over twenty bushels of wheat per acre when cropped continuously, has yielded over forty bushels of wheat, of a much improved quality. With a careful system of farming and the exercise of good judgment and energy, as is customary in the Atlantic States, the yield of wheat would average, on ordinary lands, nearer fifty than forty bushels. With titles to land secure, and the experience of the evil of continuous cropping and "volunteer" on the soil, it is likely that the practice will be discontinued, or, at least, have its most objectionable features removed. When this is done, the great increase of production per acre will attract the attention of the civilized world to the wonderful fertility of the soil of California.

All kinds of wheat have been successfully grown in this State, but there are about five different kinds which have proved remarkably well adapted to the soil and climate, viz: White Australian, white and red Chile, Chile club-wheat, and Sonora. All these varieties have especially valuable qualities, making a stronger flour than is known to be produced from the different kinds grown in the Atlantic States. A peculiar feature in the wheat grown in the interior of the State is its dryness and hardness, which requires the use of water before the grain can be profitably ground. Millers in the Atlantic States, accustomed to grinding the soft, plump grain raised there, fail in making a good quality of flour from California wheat, from lack of proper knowledge in this particular. Without a desire to impugn the excellent qualities of the grain of the Atlantic States, our people claim that California wheat is superior to any grown elsewhere in the United States, making a first quality of flour that will bear transportation to any part of the world without damage from climate. Owing to large tracts of low lands in the interior being submerged by floods in very rainy seasons, the wheat crop of some portions of the State is being harvested while it is seeding time in others. This is particularly the case along the lower Sacramento River, in Yolo

County, where the years of high water always give them very heavy crops. Portions of other counties are also similarly affected on the San Joaquin and the Lower Sacramento Rivers, the yield of wheat in such years being prodigious, considering the circumstances of its cultivation. Although the County Assessors are required by law to make accurate returns of the principal agricultural productions of their districts, they have so far failed in giving statements that can be relied on as correct. In the absence of this information, the total yield of wheat, as well as of other grains in the State, has to be estimated from the receipts at the principal places of sale and shipment, and a margin allowed for the additional grain that still remains in the hands of the farmers. Estimates made on this plan, by competent men engaged in exporting grain and milling, vary from twelve million to thirteen million five hundred thousand bushels of wheat as the crop of eighteen hundred and sixty-six. The difference between these estimates is as to the quantity of grain still in the hands of the farmers throughout the State, and it is probable that the highest estimate is correct, as it is conceded that over ten million bushels will have been received in San Francisco alone before next harvest, mainly for exportation. This amount is said by parties of good judgment, who have travelled through the greater portion of the State, to be hardly a tithe of what could be produced in favorable years, if we had the requisite population and the most approved methods of farming. Two counties alone, viz: Yolo and San Joaquin, have produced nearly four million bushels of wheat in one season; and if all the land suitable for that grain had been cultivated, it would, under the circumstances, have produced fully three times that quantity. California needs only an adequate population to vindicate her claim to be the greatest wheat-growing State of the Union.

BARLEY.

Next in importance among the cereals is the production of barley, which is the favorite food for draught animals in the State outside of San Francisco. This grain is grown in every part of the State, and is an article of immense consumption. A comparatively small portion of the crop is exported, as it brings only about half the price of wheat, while the cost of transportation is the same. Besides feeding the draught animal of the farmer, barley is the only food used for the pack-trains which do the immense amount of transportation in the interior. The extent of this business can hardly be realized by persons who have not seen it; but they can form some idea when it is known that some of the routes traversed are from five hundred to one thousand miles long, and grain food for animals has to be carried almost the entire distance. With the exception of the Central Pacific, Sacramento Valley and Placerville, and Marysville and Oroville Railroads, which form in the aggregate less than two hundred miles of road, the people of the interior engaged in mining in California, Nevada, and portions of Utah and Montana Territories, receive almost all their supplies of food, raiment, furniture and machinery through the use of teams. As steep grades have to be overcome, the draught power of animals is reduced to an average of about one thousand pounds per head in teams, and in pack-animals to about two hundred pounds each, necessitating the use of a vast number of mules and horses, as oxen are too slow to suit the requirements of trade. A very large quantity of barley is produced in portions of the State where the cost of teaming prevents its being marketed, and it is therefore fed to hogs in the field, and after threshing. The average yield of

barley, where sown on new land or land that has not been continuously cropped for a series of years, is about fifty-five to sixty bushels per acre in good seasons. Instances are very common, however, where the yield has averaged as high as from eighty to one hundred bushels; and in eighteen hundred and fifty-four, a field of one hundred acres, in Pajaro Valley, Santa Cruz County, averaged one hundred and thirty-three and two fifths bushels of clean, plump grain for the whole tract. The same remarks as to ploughing and volunteering apply to this grain as to wheat. The price of barley has ranged, during the last twelve months, at less than ninety cents per one hundred pounds, delivered at prominent points in the State, the farmer having to bear the expense of sacks and transportation. It will be readily seen that, at such prices, there is very little inducement to grow the grain to a very large extent, except in places favorable to market, more especially as there is a comparatively light export demand. Barley is, however, so sure a crop, takes so little labor, is of such general use, and can be put into pork without expense of bags or transportation, that it will always be raised to a very considerable amount in California. As a feed grain it holds the same importance with our people that Indian corn does with the people of the so-called Western States. All varieties of the grain, including Chevalier and Russian, or Nepaul barley, thrive well, the yield being, with only occasional exceptions, over fifty bushels per acre where the land is in the condition above stated. The total yield of barley for eighteen hundred and sixty-six will approximate very closely to that of wheat.

OATS.

The next cereal in importance in California is oats. This grain grows well in all portions of the State, but is of small consumption outside of San Francisco, whence considerable quantities are also exported to Australia and other points. The main portion of the crop is grown in the coast valleys, the soil and climate being peculiarly favorable for producing the grain. As a general rule, all varieties of oats yield well, but in some seasons the grain is quite light in weight. The grain ranges from thirty-two to forty-three pounds per bushel, the latter being the heaviest known. It generally brings one half more in price than barley, but the crop in the State is probably not over a tenth in quantity as compared with that grain. In the interior of the State oats are not raised to any considerable extent, owing to lack of demand, and the fact that other grain can be more profitably produced. The total crop for eighteen hundred and sixty-six will be in the neighborhood of one million two hundred thousand bushels.

CORN.

This grain is raised in many portions of the State, but the total crop is a comparatively small one, owing to light demand and low prices. Along the rivers in the interior is a considerable extent of bottom lands, which, so far as tried, have always produced generous crops of corn. Where these rivers receive their supplies of water from the snows of the "Sierras," the lands suitable for corn raising are liable to overflow as late as April, and sometimes May, when the early hot weather sets in. This has prevented many farmers from planting corn, as it has often happened that, with very late planting, the grain has not matured sufficiently before the next rainy season would set in, so that, when

harvested, the yield was both light and of inferior quality. In the valleys in the coast district corn is so raised in many places, the yield being large and the crop a certain one. The same favorable conditions are applicable in the southern portion of the State, in those places where the soil has sufficient moisture throughout the Summer season. The most famous place for growing corn is, however, the Russian River Valley, Sonoma County, where very large crops are raised, only a portion of which is marketed in San Francisco. A very large part of the crop raised there, as elsewhere, is fed to hogs, which are afterwards driven to that city and slaughtered. So far as known, corn averages all the way from forty to one hundred bushels of grain to the acre in favorable seasons. It generally brings a little higher price than barley, say one dollar and ten cents to one dollar and twenty cents per one hundred pounds; but there is no export demand, and the domestic consumption is of a very limited character. It is probable that the raising of this grain will never be very extensively engaged in, in the State, as barley can be raised everywhere cheaply, and is equally good for distilling and as a fattening grain for stock and hogs. The quality of the corn grown in favorable locations and seasons is generally superior and compares well with that grown in the Western States.

RYE.

This grain is of exceedingly small production, the demand being very light and the price unsatisfactory to producers. It can be grown in most parts of the State; but in the interior, where extreme hot weather prevails at time of harvesting, it is apt to shell out badly and waste in cutting. The grain is generally of good size and quality, but there is scarcely any demand for it as an article of food. It brings about the price of corn, and the entire crop of eighteen hundred and sixty-six was probably not over twenty thousand bushels.

BUCKWHEAT.

The crop of this grain is somewhat less than that of rye. The long, dry Summers are unfavorable to its growth as a profitable crop, as compared with other varieties of grain. The quality of the buckwheat is, however, fully equal to the best grown in the Atlantic States. There is no export demand and the home consumption is very light, the latter being still further reduced by millers grinding some wheat with it, the practice being more profitable than grinding pure grain. The total amount of the crop is variously estimated at from twelve thousand to thirteen thousand bushels.

MILLET, GRAIN AND CANARY.

All these grains or seeds are produced in the valleys along the coast, both north and south. Millet is said to be of especially good quality—in fact, superior in size and looks to any imported. Rape and canary seed are both raised, and of excellent grain and appearance; the latter, however, is frequently sent to market imperfectly cleaned. The total crop of these seeds is quite limited, having been grown to supply the home demand, which is light. Enough, however, has been ascertained to guarantee that they can be raised in sufficient quantities to supply the entire Union, if required.

FLAX SEED AND MUSTARD.

These seeds are raised in considerable quantities in the coast valleys. There are as yet no mills for using the fibre of flax for bagging, and the first oil ever made in the State from flax seed was pressed in San Francisco in December, eighteen hundred and sixty-six. There is now a mill erected that will consume one hundred and fifty thousand bushels of seed yearly, which will be imported until the farmers of this State can supply the demand. The total crop of eighteen hundred and sixty-six is generally estimated at less than one hundred tons of seed, but in view of the inducements for its cultivation it is possible that over twice that quantity will be harvested in eighteen hundred and sixty-seven. The consumption of linseed oil on the Pacific coast is already of very large extent, and promises to increase. The mustard plant is indigenous to California, and more or less is found in almost all portions of the north and south coast districts. The native mustard is a small black grain of extraordinary pungency, and is highly valued for its medicinal properties. In the south coast district it is found in vast amounts, and considerable quantities have been exported to the Atlantic ports. All the other varieties of foreign mustard have been cultivated and produced superior seed.

BEANS AND PEAS.

Both of these products are raised to considerable extent, the crops turning out large and moderately profitable. Every known variety of bean has been tried, and all have given good yields when properly planted. The varieties of beans grown are so numerous that almost any one of the large produce stores in San Francisco has for sale more kinds than can be found in most of the cities of the Atlantic coast.

Peas are very prolific, and as a general rule the size of the berry or grain is larger than the imported seed from which they have been grown. Considerable quantities of beans are exported, but the greater demand is from the mining districts, where they are a favorite article of food.

CASTOR BEANS.

The castor bean thrives most luxuriantly in all parts of the State, except in the higher districts. It is perennial and attains the size of a small tree—say twelve to fifteen feet high, with from four to six inches diameter of trunk. It is a vigorous bearer, requires no cultivation or attention, growing wild in some places where the seed has been accidentally sown. The demand for oil on the Pacific coast is quite extensive, but up to this date supplies have all been imported. The proprietors of the linseed oil mill in San Francisco are now striving to induce the raising of castor beans to a large extent, and will probably be successful in so doing. The beans are of large size, and the picking season is extended over a period of three months, when all the grain crops have been harvested. The only drawback attending the cultivation of the castor bean is the great difficulty of eradicating it in case the ground is needed for other products. There were probably twenty acres harvested in eighteen hundred and sixty-six, the total yield of which has been used for seed. The prospects are fair that within five years from date enough beans will be raised in this State to supply the demand for oil along the American Pacific coast.

CHICCORY.

This product has been cultivated for several years with great success in the interior. The rich low land along the Lower Sacramento proves admirably adapted for the raising of chiccory, of which it is said as many as one hundred acres have been grown in a season. Samples of the plant have been exhibited at the Fairs of the State Agricultural Society in Sacramento City that were from four to five feet long. The manufactured article was also exhibited, and pronounced by good judges equal to any imported. The consumption of chiccory is, however, quite small, being mostly limited to the coffee roasters, who use it as an adulteration of coffee. The plant can be raised to an almost unlimited extent, there being a very large amount of land peculiarly favorable for its production in the interior of the State.

HOPS.

The hop vine thrives in all parts of the State. It grows vigorously and produces abundant crops. The hops generally are of large size and good color and flavor. The climate of the interior is extremely favorable for hop-growing, the heat of Summer being so great as to almost cure the hops without the use of an oven. Ovens, however, are used to a limited extent, the curing process by them rarely exceeding twenty-four hours. The product is not only of lighter and brighter color, but, from the shortness of time in curing, possesses more of the *lupuline*, or hop dust, than is the case with the hops raised in the Atantic States. The vine is unusually forward in producing; hops four inches in length having been obtained the first Summer after planting. One of the largest hop growers in the State, Daniel Flint, of Sacramento County, gives the following information as to his crop of eighteen hundred and sixty-six:

"I have twenty-three acres under cultivation this year—thirteen acres of old hops and ten acres planted this year. The total product was thirty-one thousand, eight hundred and twenty-five pounds. The lightest yield that I ever had was the dry year (eighteen hundred and sixty-four), which averaged about one thousand pounds per acre. The greatest yield was in eighteen hundred and sixty-five, when I raised twelve thousand pounds on five acres, one and a half acres of the five producing four thousand six hundred pounds. The lowest I ever sold hops for was fifteen cents per pound. This year they have been extremely high, ranging from fifty to eighty-five cents per pound. The usual price has been from twenty to thirty-five cents per pound."

Mr. Flint raised his hops on bottom lands on the American river, about fifteen miles from Sacramento City. Hops, as a general rule, can be raised on all lands in the State that will produce good crops of corn. Some of the finest hops ever brought to San Francisco came from Los Angeles County. There would be very little difficulty in raising hops enough in California to supply, at fair prices, the entire consumption of the Union. Another advantage that hop growers have is the comparative immunity from the ravages of worms and the insect tribes which often seriously injure the crop in other countries. I shall dwell at length on this subject in a separate section, as it is a matter of great importance to the farmer in raising many other crops. The total crop of hops for

eighteen hundred and sixty-six is estimated at about one hundred and forty thousand pounds.

STOCK RAISING.

Almost countless herds of Spanish cattle and horses ranged on the vast plains and valleys of the interior, and the hides and tallow obtained from the former were the only inducements of trade that brought, in the earlier times, the ships from the Atlantic States to visit the coast. Hides were so plentiful that they were valued at one dollar each, and contracts for goods sold by trading vessels were often made payable in hides instead of dollars, specie being scarce, except in a few small places on the coast. Cattle and horses formed the great wealth of the native or Mexican population, land being so abundant, compared with the number of the people, as to have a very small value; with the exception of small patches of land at the Missions, very little of the soil was cultivated, and that in the rudest manner. Cattle-raising was considered the only profitable business of the country, and as large tracts of land were needed for that purpose, the Mexican Government made liberal grants when applied for. Intended for grazing purposes only, and of comparatively little value, grants of large tracts of land were made loosely and with very indefinite boundaries. From this system grew the most serious evil or drawback that the agricultural population have had to contend with since California became a State, as the grants were not confirmed for many years, and from their indefinite boundaries clouded the title and prevented the settlement of from five to twenty times the quantity of land that the terms of the grants called for. As the land became valuable for settlement, every device that cunning could suggest or fraud instigate was resorted to by the majority of the grant owners to delay a settlement of the survey, so that they could sell their title to land in excess of the quantity really belonging to them. In some cases surveyors were influenced to make surveys to include the most valuable land for agricultural purposes that could be found within the boundaries named. Some of these surveys were of the most irregular form that can be conceived, and their injustice was so plainly to be seen that they were rejected by the Courts at first hearing, and other surveys ordered. Fictitious or forged grants were also frequently used to cloud the title of lands, the imperfect condition of the archives of Mexican rule favoring the success of the same. In the southern portion of the State the grants of the Mexican Government were generally of great extent, and up to the present time have been mostly held by their original owners, who have used them for cattle-raising on a large scale. Rich in cattle, these parties would not sell their land, and thereby, in great part, prevented the development of the agricultural resources of that section of the State. The great drought of eighteen hundred and sixty-four, which had not been equalled in intensity since eighteen hundred and thirty-two, destroyed the pasturage of that locality as well as others, and, as a consequence, caused the loss, by starvation, of vast numbers of cattle and horses, making the native owners of the grants poor, except in land. The number of animals that died from starvation in eighteen hundred and sixty-four is not definitely known, but has been variously estimated at from six hundred thousand to one million head. In some cases owners lost nearly all their herds; one person in particular, who had owned seven thousand head, lost every one, and was financially ruined thereby. Out of this apparently great calamity much good will result, as it insures the sale and subdivision of large tracts of land that will hereafter be

made productive and of benefit to the State. The destruction of the vast herds of Spanish cattle and horses also opens a profitable market to the farmer, who can now raise a few head of good cattle and horses annually for sale, which he could not do successfully in previous years. American stock, more or less graded with Durham, Devon and other valuable breeds, is becoming quite general, and the probabilities favor the assertion that within a decade of years the average character of cattle in this State will compare favorably in value with those of any other portion of the Union. The same remarks apply to horses, which are improved every year by the mixture of fine blood animals, imported or brought from the Atlantic States. Our farmers have now generally come to the conclusion that a valuable animal can be kept or bred as cheaply as an inferior one. Sheep were of comparatively small numbers in the State under the Mexican rule, and were difficult to preserve from their natural enemies, the wolves, who were to be found in vast numbers all through the land. The great influx of Americans in eighteen hundred and forty-nine and eighteen hundred and fifty soon exhausted the supply and also made serious inroads among goats, great numbers of which were killed and sold for mutton in the principal towns and cities. An inferior variety of sheep was early brought in vast droves from New Mexico for meat purposes, to supply the demand. Being very profitable, the business soon became overdone, and it was found desirable to raise a breed of sheep that would be found valuable on account of the quality of their wool. All the fine-woolled varieties of sheep known in the United States and Europe were imported and crossed with the common stock, and improving the breed has continued, the poorer animals being killed off for market, until at the present time hardly a common sheep can be found, and the general quality of the wool crop compares favorably with that of many of the older States of the Union. The climate and grasses of California are well adapted to sheep-raising, the diseases common in many other places being scarcely known, and the annual increase of animals peculiarly large. Further mention will be made of this in speaking of the wool crop of the State.

SWINE.

These animals thrive well in California, and are, so far as known, free from the diseases which have been so prevalent of late years in the Atlantic States. The fertility of the soil makes the raising of hogs cheap and profitable, and their numbers could soon be increased, if required, to an almost unlimited extent. Barley is so cheap that it is used almost exclusively in hog raising, as corn is in the Western States. This feed makes sweet, firm and very fine looking pork, which for quality will compare favorably with any produced in the other States. With the exception of a comparatively small quantity of salt pork and hams and sides, mostly imported in brine from the the Atlantic ports, the domestic production supplies the home demand. But few years will pass before importations will cease entirely, and California become a large exporter of salted and cured meats to countries on the Pacific Coast and to the interior.

POULTRY.

All the domestic fowls thrive well and increase rapidly in California. Turkeys, chickens, geese and ducks, as also their eggs, sell at profitable prices—the consumption of these varieties, as well as other animal food,

being more general in California than in the Atlantic States. In this particular the people in their habits of diet are peculiar—meat of some kinds, with comparatively few exceptions, forming the main portion of every meal. In addition to the above named animals, the entire State teems with small animal life native to the country. Every variety of geese, ducks, swans, cranes, snipe, quail, grouse and other wild birds can be had in the Winter season in almost unlimited quantities. Hares, rabbits and some varieties of squirrels are abundant in all sections of the country—in some cases injuring trees and grain crops by their depredations. In some districts game animals and birds are so abundant as to form quite important items of food.

DAIRY PRODUCTS.

In dairy products California has hitherto been largely in arrears toward supplying the wants of her own people. Up to the present time thousands of firkins of butter are annually imported, as also a considerable quantity of cheese, from the Atlantic States. The high prices for these articles, however, have encouraged dairying, so that in eighteen hundred and sixty-six the production of butter and cheese had increased sufficiently to supply the greater part of the domestic demand. There is yet a large field for this business besides the local consumption, as the State of Nevada and portions of Utah and Montana Territories have to derive their supplies from California. The demand in these cases, and more particularly of Nevada, will continue and in a few years, when the country is properly developed, be largely increased. The business can be prosecuted on a large scale, and prove more profitable in proportion to the capital invested than is the case in the Atlantic States. With the advantage of prices constantly high, the dairyman incurs little or no expense to provide fodder for Winter, as cattle, with other animals, run at large and feed themselves without housing. As a general rule, however, it is considered prudent for farmers to save and stack a portion of their straw of the threshing, so that their cattle can, if the Winter proves unusually cold, have some food to eke out the scant pasturage which would otherwise be their only support. The greater portion of the butter and cheese produced in the State is made in the north coast district, the climate being milder and the grass lasting longer into the Summer.

HONEY BEES.

Since the introduction of bees from the Atlantic States raising honey has been found a most profitable business to engage in. Besides the making of large amounts of honey annually, which brings very remunerative prices, the bees swarm to a degree not known in the other States of the Union. Instances have been known where, from a stock of five strong hives in the Spring time, forty hives, with strong, healthy swarms of bees, were had before the commencement of the rainy season. In the business of honey making it is believed that California has no superior in the known world. With ordinary care and attention bees can be raised free from disease and yield at least twice the quantity of honey during the season that can be had in the other States.

GREEN FRUIT.

To the inhabitants of the Atlantic States the statements of the early

bearing of trees, their prolificness and size of products in California will, when compared with those of older States, seem to be exaggeration or boasting. Many varieties of trees bear in their second or third year from planting, the fruit being, as a general rule, of extraordinary size and in great quantity. Apples and pears of all varieties do well in almost every portion of the State, with this peculiarity, that what are elsewhere considered Autumn fruits mature in Summer, and Winter fruits in Autumn. This is caused by the mildness of the Winters and forwardness of the season. The same remarks apply to almost all other varieties of green fruit, which, maturing earlier, naturally go out of season proportionally sooner. Peaches grow well, and are to be had of a size and flavor that cannot be surpassed elsewhere. In some districts the curled leaf disease has prevailed, but has not so far caused great danger, considering the large number of trees and their imperfect culture. Quinces grow to a size and have a flavor not exceeded in any country. Plums are produced in great quantities, their abundance being so great as often to break down trees by the weight of fruit. Prunes of all kinds, so far as tried, have done well. Cherries are of extra size, the trees healthy and great bearers, and are a most profitable fruit to raise. Nectarines and apricots, of unsurpassed appearance and flavor, are also produced. The following are the largest specimens of the above fruits exhibited in San Francisco, namely—Apples (Gloria Mundi variety), thirty-two and thirty-four ounces; pears, eighty-four ounces; plums, seven ounces; apricots (Moorpark), sixteen ounces; peaches, from one third to one half size larger than the same varieties cultivated in the Atlantic States. All of these fruits are free from the ravages of insect life.

SEMI-TROPICAL FRUITS.

Oranges of fine size and flavor are to be had in all parts of the State, ripening from November to April. The crop is a most favorable one, as the trees bear unusually full, while the fruit finds a ready sale at remunerative prices. Lemons of three varieties are grown in the southern coast district, namely—the California, or native lemon, which is of large size, and apparently a cross or hybrid with the citron, having the thick rind of the latter with the flavor of the lemon; and the Malaga and Sicily lemons, grown in the same district, from the seed, produce unusually large and fine fruit, and bring profitable prices. Limes of unusually large size and good flavor are produced in the same localities. Citrons of unsurpassed excellence and size are to be had in the south coast district, but are as yet only valued for their perfume or aroma and beauty. It would be an easy matter for California, say in eight or ten years, to supply the entire Union with the preserved citron of commerce if proper efforts were made to do so. The fruit is of unusually large size and perfectness. For the purpose of giving some idea of the cultivation of the above semi-tropical fruits, I give the statistics of the crop of eighteen hundred and sixty-six, and size of specimens brought to San Francisco: Oranges, about two hundred and fifty thousand. As many new trees have just been set, and others are coming into bearing, parties well informed in the trade estimate that the crop of eighteen hundred and sixty-seven, unforeseen drawbacks excepted, will be at least double the above quantity, all from the vicinity of Los Angeles. For richness of coloring and flavor these oranges are not equalled by any fruits imported from the Hawaiian and Society Islands, Lower California, Mexico, Central America or Panama. The total consumption of this fruit in eigh-

teen hundred and sixty-six was about three million. California-grown oranges range from six to twelve ounces each. Lemons of the three varieties, of which the native lemon, although of large size, is the poorest and little used, range in weight from eight to sixteen ounces each. Fruit raised from Malaga and Sicily seed grows to an enormous size compared with that which is imported. Specimens of the Sicily variety have been grown averaging twelve and thirteen ounces each, taken indiscriminately from boxes on sale. The Malaga variety is also of large size, but somewhat smaller than the Sicily. The crop of eighteen hundred and sixty-six was about forty thousand, all from the vicinity of Los Angeles. Limes are of twice the size of the average imported fruit. Many specimens have been had this season weighing four and five ounces each. The total crop for eighteen hundred and sixty-six was about sixty thousand, which will probably be doubled in eighteen hundred and sixty-seven, as will also be the case with the Malaga and Sicily lemon. Of citron, not over four thousand to five thousand have been marketed this year. Those sent to San Francisco ranged from twenty to forty-six ounces each.

DRIED FRUITS.

Figs of all the varieties known in the civilized world thrive and bear well in California, being produced in all parts of the State in the valley lands. The native fig is of a purplish black color, with a blue bloom, and is a hardy fruit, bears profusely, and is cured in considerable quantities. The extent of the crop is not definitely known, as it is scattered all over the State; but good judges estimate it at about fifty tons weight. The large Turkey white fig has been introduced, and the fruit being of large size and fine flavor, is mostly consumed in a green state. The fruit of the first crop of this variety, marketed in San Francisco, averaged from three to five ounces each. The price paid for table use is so great that the larger portion of the crop is sold by producers without curing. So far as known, no dried figs of this variety have been made, other than small lots from the second crop for private use. Their quality is said to have been of superior excellence. The Italian and other varieties of this fruit have done well; but the production of all the white and brown varieties has as yet been quite limited. Enough, however, has been cultivated to prove that large quantities could be produced by propagation and ordinary care. Prunes have already been mentioned in connection with green fruits; but it is proposed that their importance as a dried fruit should be stated. The German prune is a good bearer, the fruit being of good size and flavor, and much used without curing. There are quite a number of French varieties of prunes cultivated, which, when dried, make excellent fruit. The long, or Bordeaux prune, which is such a favorite with the American public, is not as yet introduced into California. The crop of dried prunes of all kinds made in eighteen hundred and sixty-six was about thirty-five tons weight. Of the round French prune, one man in the vicinity of Petaluma made twelve tons, the fruit being very large, pulpy and toothsome. From the attention which the cultivation of the prune has attracted, it is probable that in a very few years the fruit will be cured in sufficient quantities to admit of exportation to the Atlantic States. While on this subject it is proper to state that comparatively large quantities of apples, pears, plums, peaches, nectarines and apricots have been dried in eighteen hundred and sixty-six for domestic consumption. Zante, or black currants, have been made this year from

the black Corinth grape. The quantity made was very small, but it has demonstrated clearly that fruit of a superior quality can be made, and its culture profitably engaged in. The black Corinth, or seedless grape, is a vigorous grower and prolific bearer. For quite a number of years attempts had been made to introduce the vine into the State, and considerable money spent in so doing. A great many cuttings and rooted vines were imported by various parties, who subsequently found that deception had been practiced on them, the fruit proving to be of other varieties. Several persons have been at last successful in getting the true vine, and its culture will be prosecuted in all portions of the State as soon as cuttings in sufficient quantities can be had. A sample of this fruit will be sent to the Department of Agriculture for exhibition. Compared with the imported fruit, that raised in California is of somewhat larger size, has very little sugar, but a more decided currant flavor, is cleaner and of a more uniform black color. Before the end of the present century it is very probable that the production of this fruit in California will be sufficient to supply the entire demand of the Union.

RAISINS

Have been made in considerable quantities in the State during the last four years. Those produced from the Feher Szagas or Fiher Zagos grape (Hungarian) are considered by good judges as superior in every respect to the imported or Malaga fruit, with the exception of size of berry and deep bloom. The Fiher Zagos raisins are of a light red color and white bloom, of medium size, have a thin skin, tender pulp and seed, are of pure, sweet flavor, and free from the musky taste that is common in all imported fruit. This grape was brought from Hungary to California in eighteen hundred and fifty-three by a native of the former country. From two small cuttings, or roots, at that time, the culture has spread until there are now probably fifty thousand bearing vines, and at least three hundred thousand cuttings and roots planted, all of which will be in full vintage in eighteen hundred and seventy. The vine is a most prolific bearer, averaging, in the largest vineyard in the State, from thirty to forty pounds per vine, at six years of age. Prior to eighteen hundred and sixty-two, the grape was confined mostly to one vineyard, situated in the edge of El Dorado County, about a mile from Mormon Island, a noted gold mining locality in earlier days. In that year, B. N. Bugbey, ex Sheriff of Sacramento County, saw the grape, and drying it found, as the result, raisins of a very superior quality. Purchasing the vineyard, he at once commenced propagating the vine. In eighteen hundred and sixty-three, he made the first public exhibition of raisins, and from two hundred boxes, or five thousand pounds, in that year, increased the amount to fifteen hundred boxes, or thirty-seven thousand pounds, in eighteen hundred and sixty-six. The vine is trimmed (like others in California) in the shape of a low bush or tree, the main stalk not averaging eighteen inches above the ground. The young wood is staked up to about four feet high, and the runners pinched in during the Summer so as to throw out lateral shoots, the leaves of which protect the fruit from the rays of the sun.

Considerable discussion has been made, by several noted viniculturists, as to the derivation of this grape; some contending that it is a variety of the "Larga" family, or Malaga raisin grape, of which the white Muscat of Alexandria is a member. From personal comparison with the White Malaga, Muscatel and white Muscat of Alexandria grapes, in the

same vineyard, I am satisfied that the Fiher Zagos grape is a totally distinct variety, varying in shape of leaf, color of fruit, bloom, shape and size of berry and bunch, tenderness of skin, pulp and seeds, and a perfect freedom from all trace of muskiness, which is plainly perceptible in all the other grapes named. The grape is also most excellent for table use, but is too tender to bear long. transportation. A very fine variety of golden colored wine is also made from it, which in flavor is between sherry and Madeira wine. The fruit grows in long bunches, with many spurs from the main stem, the berries being of oblong shape, light green translucent color, and varying in size from the middle of the bunch down.

Considerable quantities of raisins have been made from the Muscat of Alexandria grape; but besides the musky flavor, as far as I have seen, they have an inherent disposition to absorb moisture and ferment. The White Chasselas and other kindred grapes have also been dried; but, as they are without any perceptible pulp or sweetness, with tough skin and large, hard seeds, they have not met a profitable market. Large quantities of Mission or California grapes have been dried, and, being pulpy and of pleasant flavor, are proving an excellent substitute for the usual second quality of raisins used for cooking purposes on board shipping. The total crop of raisins and dried grapes for eighteen hundred and sixty-six is estimated at about forty tons weight, nearly one half of which were from the Fiher Zagos grape. As this variety is a most excellent keeper, besides its other good qualities, it is being propagated largely in all portions the State, about three hundred thousand cuttings having been sold by one cultivator this year, to be delivered in the planting season of eighteen hundred and sixty-seven.. From present appearances, it seems probable that California will be enabled to supply the entire Union with raisins before the close of the present century.

OLIVES

Thrive well in every portion of California where they have been planted. The French, olive, however, which is common in some portions of the State, is of small size and quite bitter, and makes an inferior quality of oil. The Seville, or Spanish olive is as yet of limited cultivation, and mostly confined to the south coast district. Being a slow fruiter, very little attention has been attracted to the cultivation of the olive among our agricultural population, who, as a general rule, are not disposed to plant any tree or vine that does not bring a speedy crop. The notices of the public press upon the value of the olive tree for fruit and oil have attracted much attention during the past year, and many farmers are now disposed to plant a few trees as a venture. It is probable that, if no change takes place in the present feeling of farmers, the cultivation of the olive will become of considerable importance within the next ten years.

NUT FRUITS.

All varieties of nut fruits, so far as tried, have been found to thrive, and bear well in most portions of the State. Almonds of Ivica, Languedoc, Princess, paper shell, and Marseilles hard shell, have been grown, producing fruit of most excellent quality. As a rule, the shells of all nut fruits grown in California are thicker and harder than those of similar fruits grown in Europe and the Atlantic States. Almonds are a very profitable crop when care is taken in curing them of a bright color,

and the tree is being largely propagated in almost all parts of the State. A variety of walnut, native to some portions of California, resembles greatly the black walnut of the eastern portion of the Union. The shape of the nut is the same, as also its inside formation; but the outer surface is only veined, instead of being rugged or rough, like the black walnut. It is mostly found along the lower Sacramento River, and in a few small valleys of the north coast district. Growing rapidly, and making a very ornamental shade tree, of good wood, the tree is now much propagated by farmers. The flavor of the meat partakes of both the black walnut and butternut of the Western States. Madeira nuts, or English walnuts, are cultivated in all portions of the State, being, however, most plentiful in the vicinity of Los Angeles, in the south coast district. The tree bears in from six to eight years; is of fine appearance; good quality of wood for cabinet purposes; while the fruit, being superior in quality to that imported, brings profitable prices. The tree is a vigorous bearer at ten years of age, often producing one hundred pounds of nuts, and at thirty years old is said to have borne one thousand pounds in one season. The cultivation of the Madeira nut is largely engaged in, in almost all of the valley counties, and the probabilities are that the production will supply the home demand in a very few years. Peanuts prove a very profitable crop to producers, the yield, in favorable seasons, averaging from one hundred and fifty to two hundred bushels to the acre, in suitable localities. The nut in California is, on an average, double the size of those produced in the Carolinas or on the coast of Africa. The crop of eighteen hundred and sixty-six was about two hundred tons, and mostly grown on the low land of Yolo County, on the lower Sacramento River. The cultivation of chestnuts, so far as tried in the State, has proved successful; but few trees have as yet produced fruit, and those, so far as known, are situated in the Sierra Nevada district, near Placerville, in El Dorado County. The tree is being grown in quite a number of counties, and it is probable that its culture will prove extensive in some sections of country where the native timber is becoming scarce. The variety now cultivated is the same as that grown in the Atlantic States. Attempts have been made to introduce the Japanese chestnut, which is of the same size and variety as the Italian, but I believe thus far without success. The inauguration of regular steam communication with Japan will probably admit of bringing small trees in safety from that country, in which case but a short time will elapse before the cultivation of this variety of nut will be largely engaged in. Hazel-nuts are native to California. But little attention has been paid to them, and very few collected for sale in San Francisco. It is believed that the filbert nut could be grown to good advantage, and it will probably be introduced before many years have passed.

BERRY AND OTHER SMALL FRUITS.

All the berry fruits grow prolifically in California. Strawberries of some varieties are to be had grown in the open air from March to November, and from hothouses the balance of the year. They are almost constantly on sale in the markets of San Francisco. The fruit is of remarkable size, those of the British Queen variety having been grown fifteen berries to the pound, while the White Chile variety has produced berries of nearly three ounces in weight. Raspberries grow of fine size and superior in flavor to those produced in the Atlantic States. Blackberries are most prolific bearers, with fruit of extra size and flavor.

Huckleberries have so far been of very limited cultivation, their place in the market being mostly supplied by a variety of small blueberry that is a native in some localities of the north coast district of California. There are also some varieties of native berries found along the coast from Mendocino County to Oregon called salmon, squaw and other berries, which are said to be of excellent flavor. The cultivation of the cranberry has been repeatedly attempted, many thousands of the roots having been imported from the Atlantic States and Washington Territory; but none of the domestic fruit has yet been produced in this market. Red, white and black currants have been grown to considerable extent, and have always brought remunerative prices. The red cherry currant in particular has been raised of very large size, the berries in some cases being as large as ordinary sized grapes in the Atlantic States. Gooseberries do well, but as a general rule the berries are smaller than those of the same varieties in other countries.

VEGETABLES.

All the varieties of vegetables known to the Atlantic States and Europe thrive well in California. Many of these vegetables, as before stated, are grown in the open air, and are gathered in every month of the year, and as a general rule are equal and in some cases superior in quality to those of the Atlantic States, while the size is also much larger. In order that comparisons may be made by others, I give the following weights of the largest specimens grown in the vicinity of San Francisco:

Vegetables.	Pounds.
Irish potatoes	7
Sweet potatoes	26
Beets	135
Cabbage	56
Turnips (white)	26
Turnips (yellow)	14
Carrots	31
Onions	2½ to 4
Tomatoes	2½
Watermelons	34

A pumpkin, three hundred and fifty pounds, which, with five others grown on the same vine, weighed nineteen hundred pounds; crooked neck squashes have been grown weighing from ninety to one hundred and ten pounds. Of the prolificness of the potato, it is a matter of undisputed record that a Mr. Hill, of Pajaro Valley, in eighteen hundred and fifty-five raised from the cuttings of a single large potato eight hundred and fifty-three pounds, merchantable weight, which were exhibited in San Francisco. There is scarcely a vegetable known that is not produced of larger size than is grown in the Atlantic States. The great production of most of these vegetables is mainly confined to the north coast district, the intense heat of Summer in the interior valley district preventing their successful production except in the early portion of the year.

TEXTILE FIBRES.

Cotton, of the short staple variety, has been grown to a considerable extent in the interior portions of California. For a long time the theory advanced by one or more prominent agriculturists in the State, that cotton could not be successfully grown in consequence of lack of humidity of climate, prevented attempts at its culture. In eighteen hundred and sixty-five, however, experiments were made, mostly in Tulare and Los Angeles Counties, some four hundred and fifty to five hundred acres being cultivated. The theory that the plant necessarily required a large amount of moisture led planters generally to irrigate them when in bloom, which was attended with most disastrous results. The bolls which had partly formed fell off and new ones took their place, the latter not maturing well before the rainy season set in. As a result but a comparatively small amount of cotton was gathered—the total crop of eighteen hundred and sixty-five not amounting to over sixty thousand pounds when ginned. The planters saw the mistake when too late to remedy it that season, but felt encouraged to plant and cultivate in a different manner the succeeding year. I have been unable to ascertain with any degree of accurateness the number of acres planted and quantity of ginned cotton raised in eighteen hundred and sixty-six—planters when applied to by letter evading replies in answering, or neglecting in some cases to write at all. As a class, the present planters are very reticent in giving any information regarding their experience, some of them having still on hand a portion of the cotton grown in eighteen hundred and sixty-five. Enough, however, is known to prove that cotton can be cultivated at a profit by white labor in California. The following instance of the crop of eighteen hundred and sixty-six, which I have from a reliable source, illustrates the ease with which cotton can be grown:

Two men emigrated from Missouri in eighteen hundred and sixty-five, and took up a quarter of a section of land in the vicinity of Visalia, Tulare County. Neither of them had ever engaged in cotton growing, their only knowledge being derived from a person who had travelled through the Southern States and seen it growing there. They ploughed some sixty acres of land in February and March, and early in April planted, and afterwards gave the crop one hoeing. Being in reduced circumstances, one of the men went off to some distance to work while the crop was growing, and the other hired out in the neighborhood of the farm. The plants were not irrigated, nor was any work done on the crop until it was gathered. During the Summer an irruption of grasshoppers destroyed about thirty acres of the crop, but the balance (thirty acres) turned out a little more than six thousand pounds of first quality, short staple, ginned cotton. Parties who have formerly been engaged in cotton raising in Tennessee and Mississippi, and are conversant with the experiments in growing cotton in California, state that it can be grown cheaper with white labor here than with slave labor there, owing to the absence of crab grass and other weeds, which there necessitate constant labor in cultivation to prevent the cotton plant from being destroyed. The long rainless Summer season also admits of gathering the crop without injury, and frost is rarely experienced until December. The total amount of land planted in cotton in eighteen hundred and sixty-six is estimated as somewhere near four hundred acres, in twenty-acre patches. It is estimated that there are from fifteen thousand to twenty thousand acres of good cotton land in Tulare Valley and its vicinity, and much larger amounts in the other portions of

the State. It is believed that the long staple, or Sea Island variety, could be successfully and profitably grown in the southern coast district; but, so far as known, it has not been tried. In eighteen hundred and sixty-three I was shown a sample of cotton gathered in the Mission of San Gabriel, Los Angeles County, which was supposed to be a wild variety. My informant stated that it was produced by a tree some fifteen to twenty feet high, the trunk or main stem being some seven or eight inches in diameter. The cotton was much discolored and injured from lying on the ground after rain, and I could not judge of the value of its staple, which was very fine and quite long. The seeds, however, were of the Sea Island kind, being smooth and black. Subsequently, on visiting the Sandwich or Hawaiian Islands, I found that the Sea Island cotton there became a perennial, growing to the size of a small tree, bearing crops every year. I therefore think that in all probability the tree reported at San Gabriel is from the Sea Island seed, the more especially as there are occasionally Winters there without frost. Should my view in this matter prove correct, it is very likely that California will in time take rank with the secondary cotton-growing States in the Union.

Flax, wherever planted, has so far produced good crops of seed. The valleys of the north coast district seem to be peculiarly favorable to its successful culture, but there is very little or no doubt that it could be profitably grown in almost all parts of the State, as it is found growing wild in the Sierra Nevadas from two thousand to two thousand two hundred feet above the level of the sea. There is a very large demand for seed for oil purposes, but there is also an immense demand for its fibre to manufacture bagging for grain and wool. Parties are now organizing a company which will engage in manufacturing bagging as soon as the culture of flax becomes extensive enough to warrant the investment. Hemp of good quality has been grown in Russian River Valley, Sonoma County. It is said that it produces largely, and it can be grown at very little expense.

The extensive culture of this product will be engaged in, no doubt, as soon as a market for it can be had. I have been informed that a species of nettle vine, which grows wild near Santa Cruz, possesses a remarkably fine, long and strong fibre. It is said to be of great fineness, pliable and glossy like silk, and extends the entire length of the vine, specimens having been procured thirty feet in length. I have endeavored to procure samples of this fibre to send for exhibition in the Department at Washington, but have so far been unsuccessful.

WOOL GROWING.

California possesses a soil and climate admirably adapted to the growing of wool. The indigenous grasses of the country are all very nutritious, while the long, dry Summers and mild Winters admit of the raising of sheep without a tithe of the expense and risk which is common in the other States of the Union. The original stock of sheep, as before stated, was of very poor quality for producing wool, but in the last twelve years it has been so crossed or bred with fine sheep, imported from the Atlantic States and Europe, that the original stock has nearly disappeared. All varieties of blood sheep have been imported, but the French Merino has been most largely used, and the greater part of the wool crop is more or less crossed with it. Spanish Merino, Saxony, Cotswold,

Southdown, and other varieties are in considerable numbers, but they form a small proportion of the whole, and are not propagated as generally as the French Merino. There are two wool crops during the year, viz: The first, or Spring shearing, in May, which produces the longest wool, and the second, or Fall shearing, in September. The second shearing produces a shorter wool, the great bulk of which is exported to Atlantic ports. The two shearings are caused by the necessity for getting an average strong staple, as during the heats of Summer the wool ceases to grow for a time. The result is that when it grows again there is a weak spot in the fibre which injures it for spinning. Another cause which also contributes to the two shearings is the prevalence of a species of wild clover in some portions of the State. This clover while green makes excellent feed, but its seeds when matured are contained in spiral burrs, which, from their corkscrew shape, cannot be readily got rid of when entangled in the fleece. By shearing early in the Spring the evil of burrs, as well as the seeds of the alfilerrillo, which are long but spiral, are mostly avoided, and the wool marketed in a comparatively clean state. The fleeces of California wool are seldom washed before shearing, and therefore contain a very large percentage of dust and grease, the loss in weight averaging from forty to sixty-five per cent., according to condition, in scouring. The Spring crop of wool for eighteen hundred and sixty-six was four million nine hundred and thirty-four thousand nine hundred and fifty pounds; the Fall crop, two million two hundred and forty-four thousand five hundred and fifty pounds, and seven hundred and fifty-four thousand five hundred and eighty-seven pounds pulled wool during the year, making a total of seven million nine hundred and thirty-four thousand and eighty-seven pounds—of which the local factories of San Francisco bought three million one hundred and eighty-nine thousand five hundred pounds, while four million six hundred and sixty-two thousand one hundred and twenty-nine pounds were exported, mostly to the port of New York. The quality of the wool put up in eighteen hundred and sixty-six showed a marked improvement in both fineness and cleanness on previous clips, and it is believed that in a few years more our wool will compare favorably with that of any other State in the Union. The Spring clip for eighteen hundred and sixty-seven is estimated at about seven million to seven million five hundred thousand pounds. This estimate is based upon an increase of one hundred per cent. in lambs, less twenty per cent. killed for market, or two hundred and forty thousand seven hundred, and fifteen per cent. of wethers, or two hundred and twelve thousand three hundred and eighty, all butchered in eighteen hundred and sixty-six—making a total of four hundred and fifty-three thousand and eighty sheep taken for the above purpose. The average fleeces are put down at three and a half pounds each, or seven million five hundred and eighty-two thousand, which, with proportionate Fall crop, will make the total crop of eighteen hundred and sixty-seven amount to nearly twelve million pounds, pulled wool included. The wonderful fecundity of sheep in this State promises in a few years, if no season of drought like eighteen hundred and sixty-four intervenes, or no epizootic disease breaks out among them, to make California one of the greatest if not the most important of the wool-growing States. There is a vast amount of land not cultivated at the present time which is well adapted to sheep-grazing, and, as woollen manufactories are on the increase, the home market for wool will stimulate wool-growing by increasing its profits. The consumption of wool in eighteen hundred and sixty-seven promises to keep pace with the increased production, as

one first class mill, which will consume nearly a million of pounds, and another requiring nearly half that amount, have just been built in San Francisco. Another woollen mill is in process of construction at Marysville, and projects for the erection of others at points in the interior are being extensively canvassed by capitalists. With the opening of the steam line to China and Japan, our manufacturers will in all probability find a new and profitable market, which, with the aid of cheap Chinese labor, they will be able to supply in competition with manufacturers of the Atlantic States. There are also many new branches of woollen manufactures that the domestic consumption on the Pacific coast will in a few years induce capitalists to invest in, the more especially as additional markets for the same articles are to be found in British Columbia, Mexico, and some portions of Central America, to which our steam communication now gives us ready access. All these things considered promise to stimulate wool-growing to a very great extent by making it profitable.

SILK GROWING.

The business of silk growing has already assumed considerable importance in California, and promises, in a very few years, to attain dimensions that will attract the attention of the civilized world. The soil and climate of this State seem to be peculiarly favorable to the growth of all varieties of the mulberry tree. The climate, from its dryness in Summer and freedom from thunder storms, is said to be better adapted to the culture of silkworms than any other country. These advantages early attracted the attention of several persons, who were further stimulated by the fact that an indigenous worm had been found in some portions of the State spinning cocoons resembling a coarse silk. In the Spring of eighteen hundred and fifty-four, L. Prevost, in connection with Henry Hentsch, a banker of San Francisco, imported a considerable quantity of mulberry seed, which was planted, and produced fine trees. Efforts were made to import silkworm eggs from China; but they, on three different occasions, proved to be bad, only a few of the last lot hatching. Another lot of eggs, however, was imported from France in the Spring of eighteen hundred and sixty, by Mr. Hentsch, which proved to be healthy, and hatched finely. These worms produced fine cocoons, specimens of which were sent to France, and there pronounced of the first quality. The culture of silk then began in earnest, and has been continued and increased nearly a thousand fold up to the present time. No disease of any kind has been found among the worms when fed with fresh food. They now bear so high a reputation for healthfulness, that orders for eggs from France and Mexico have been received, for several years past, far in excess of the ability of silk growers to supply. From the planting of a few thousand trees in the vicinity of Santa Clara, and the raising of a few thousand worms, the business has spread so that hundreds of thousands of the various kinds of mulberry trees have been planted, and millions of cocoons raised. Silk growing is largely engaged in in various sections of the State, and in every case the worms have proved healthy, and made fine cocoons. The process is so simple that no difficulty has been experienced by parties growing silk for the first time. Mr. Prevost states that not only is the process simple, but the circumstances of climate are so favorable that one person in California can attend to as many worms as require eight persons in France. The mulberry, thriving finely, with the cheapness of land in this State, he asserts, makes a greater difference than the

higher price of labor. From his experience, Mr. Prevost claims that silk can be produced in California so as to pay a fair profit, and enable the grower to undersell the product of the cheapest labor country that produces silk. A vast demand exists for eggs, which can be sold in quantities of one hundred pounds or more at twelve dollars per ounce (cash) at place of export The feeling of the agricultural public is so favorable to silk growing that it is very probable it will soon hold high rank among the important productions of the State. A silk manufactory has been established in San José, and a number of pieces of dress silks and other goods made, which, for lustre, beauty and fineness are said, by good judges, to compare favorably with the best quality of similar articles imported.

TOBACCO.

Tobacco has been grown in most of the valley counties of the State, and has invariably given a fair yield. The quality of the leaf, however, has varied greatly, according to locality and knowledge of curing by the party raising it. In the first years of the late rebellion, very large quantities of tobacco were raised, but the greater portion of it was badly damaged in curing, much of it resembling weeds or hay, having no true tobacco flavor. When grown on rich, low land, the plant produced a thick, coarse leaf, with a sort of down on the under side, and had considerable gum when dried. When grown on drier places the leaf was fine, but of very light weight, fields not averaging two thirds the weight of cured tobacco that the same appearance would realize in the Atlantic States. Considerable good tobacco was produced in Santa Clara, Colusa, and Napa Counties, some of which was manufactured into excellent twist and plug for home consumption. With proper knowledge of cultivation and curing, a very fine article of smoking and manufactured chewing tobacco can be had, in quantities to supply the demand on the Pacific coast. At present the cultivation of tobacco has dwindled to quite a small amount, and very little inducement in price is offered to increase their crops.

SORGHUM.

The Chinese sugar cane, or sorghum, has been cultivated to a comparatively large extent in previous years. The difficulties attending the making of syrup by new hands, and the large expense entailed by way of machinery and pans has been a great drawback in its culture. So far as known, no sugar of consequence has been made, and, as a general rule, from the ignorance of those making it, the quality of syrup offered in this market has been quite inferior and slow of sale, at unremunerative prices. A very large amount of land is well adapted to its cultivation—the cane, wherever planted, growing vigorously, and yielding an abundance of juice.

SUGAR BEETS.

The great consumption of sugar on the Pacific coast is stimulating its production, and efforts are now made to inaugurate sugar beet culture by the gratuitous distribution of seeds to farmers. It is intended by one of the proprietors of the sugar refineries in this city to remove his works to the vicinity where the sugar beet produces the most sugar per acre, and engage in its manufacture. The seed will be sown quite extensively in different portions of the State in eighteen hundred and sixty-seven, and samples of the beets produced forwarded to San Francisco

for testing. There is very little doubt that sugar beet culture will prove successful, and become of great importance in the list of staple productions.

SUGAR CANE.

It is by no means decided that the cultivation of the sugar cane cannot be profitably engaged in, as is the case in Louisiana and other sugar-producing States. By the aid of steam lines to the Hawaiian Islands and Mexico, fresh cane can be brought to San Francisco for planting, which could be renewed every year, if required. I have been credibly informed that B. D. Wilson, of Los Angeles County, in eighteen hundred and fifty-seven, planted a patch of about forty acres in sugar cane, imported from Mexico. The canes were planted in June, and grew finely; but before cutting, in December, a sharp frost came and destroyed their value for sugar. About two or three acres were cut and boiled in ships' trypots, the result being an inferior quality of syrup, which was sold to Indians and Greasers. Disgusted by the result, and wine making being very profitable, Mr. Wilson planted the ground with vines, and abandoned all further attempts at sugar making. A very large quantity of land can be had in the south coast district suitable for cane growing, if its profitableness can be once clearly demonstrated.

RICE.

This grain has not as yet been grown in the State, although large sections of country along the Lower Sacramento and San Joaquin Rivers and tributary streams are eminently adapted to its cultivation. These lands, known as "tule" lands, are extremely productive when reclaimed, and would undoubtedly produce very large crops of rice. An additional incentive to the cultivation of this grain is the immense consumption by Chinamen, of whom there are some sixty thousand in the State, with a prospect of the number being soon largely increased by additional immigration, as cheap labor will be required for the prosecution of public works. The annual consumption of rice on the Pacific Coast, which is supplied through the single port of San Francisco, amounts to about forty million pounds. Land suitable for rice growing can be bought of the State for one dollar and twenty-five cents per acre, with a long credit, to enable the purchaser to reclaim it. This is done by levees, at comparatively small expense; and the land, in two years time, produces as large average crops of grain as can be had in the other districts.

Public attention has been attracted to rice growing, and it only needs the successful cultivation of a single acre to induce the planting of thousands of acres the following seasons. This will undoubtedly be done in a few years, when, if successful, a new and important product will be added to the agricultural wealth of the State. Persons who have seen rice growing in the Carolinas state that the culture of this grain can be carried on at half the expense, per acre, in California. An additional advantage in its cultivation is to be found in the skilled labor of the Chinese, who can be had in numbers at low pay.

NUTMEGS, TEA AND PEPPERS.

A species of the nutmeg tree is indigenous in some portions of California. The fruit is longer and smaller than the imported nutmeg, and

also has a smoother coat or covering, the nut in appearance resembling the pecan nut of Texas. The flavor of the native fruit is similar to the imported, but possesses less essential oil and strength of aroma. This nutmeg was only once on sale in San Francisco, which was some years since, when the imported fruit was entirely out of the market. I am unable to give any definite information as to the locality and number of trees, etc., as I made no memoranda at the time; I am, however, convinced that the imported nut could be successfully grown in California and pay a fair profit to producers.

The culture of the tea plant has been repeatedly attempted, but the seed or nuts sent from China have, with the exception of one case, failed to germinate. The nuts that were alive were raised in a hot-house, in San Francisco, with great difficulty; but the plants, at the end of a year, seemed in a thrifty condition for transplanting. This was done by potting them; but, being exposed to unusually cold and windy weather, the plants all died. With direct steam communication of less than thirty days voyage from the Chinese and Japanese tea ports, it is highly probable that plants in vigorous condition can be imported from those places, and prove a success. The hillsides and valleys and the climate of the north coast district would seem to be well adapted to tea growing, and, if the plants can be safely imported, may, in time, prove a large tea-producing section of the State.

The pepper tree of commerce is said to have had a single representative in California a few years since. My informant, who is conversant with grain black pepper, stated that the grains of the California tree were similar in shape, size and pungency to the imported grain.

TIMBER TREES AND THEIR PRODUCTS.

The timber trees of California are of considerable number and are an important source of wealth to her people. The Sierra Nevadas are clad for hundreds of miles with heavy forests of pine, fir and cedar, which as a general rule can be transported only at great expense at the present time. Vast quantities of lumber, however, have been used in mining towns and mining operations, while some of the finer timber, such as sugar pine, has been hauled from the most accessible places to towns in the interior remote from cheap water communication. Along the coast, from Monterey to the borders of Oregon, a belt of various kinds of timber trees is found, from which the great supplies of San Francisco, Sacramento City and the farming districts around the Bay of San Francisco are derived. The lumber most in demand is known as redwood, a species of red cedar, which is found along the coast from Santa Cruz to Trinidad. At Monterey a species of cypress is found, which is said to be the only tree of that variety in the State. At Humboldt Bay the prevailing woods are white fir and pine, which are much used for fencing. At Port Orford and Coos Bay is found a species of yellow pine, and two small belts of white cedar not found elsewhere in the State. Another species resembling the Georgia yellow pine is found all along the coast from Monterey to Oregon. The trees grow to a monstrous size, in some cases redwood having been found sixteen feet in diameter, and some of the other varieties ten feet in diameter at the butt. Of the redwood variety the museum of the Department at Washington contains a specimen of redwood plank, from Albion River, which is seven feet five inches wide, free of sap and clear of knots. The sugar pine of the interior is also found of large size and, with Port Orford cedar, is valued very highly as

a good substitute for the white pine of the Atlantic States, and is used in all fine wood work. A most excellent variety of hard wood termed laurel is found in considerable abundance in the interior of the State. Large quantities of this wood were used for fuel until its excellence for cabinet and furniture manufacture was discovered a few years since. Its value is now so well established that it competes successfully with the finer varieties of imported woods. A peculiarity of the laurel is the facility with which it may be stained to imitate the finer hard woods. It is extensively used when stained and polished to represent Brazilian rosewood, black walnut, satin-wood, mahogany and other woods. The imitation is so perfect that good judges have been deceived after careful scrutiny.

ROSIN, TURPENTINE, AND THEOLINE.

These products are derived from the trees of the Sierra Nevadas. The first two are procured by tapping the sugar pine and white fir trees, the quality of the spirits of turpentine being good, while the rosin (of which only one variety is made) is preferred by soap makers and others to that produced in the Carolinas. Theoline and rosin are derived from a species of fir, found at a greater elevation than the other trees named. The property of theoline for cleansing clothing and gloves is said to be remarkable, while the rosin is of the best quality. No tar or pitch is manufactured, as the trees are never cut down, and do not contain knots of pitch to admit of burning for tar or pitch. The sugar pine and white fir are to be found in almost unlimited numbers along the whole length of the Sierra Nevadas; but, so far, the making of turpentine and rosin has been limited to small districts in Butte, Yuba and Nevada Counties. The production of eighteen hundred and sixty-six was: Spirits of turpentine, forty thousand gallons; rosin, fourteen thousand boxes, of two hundred and eighty pounds each; and of theoline, an inconsiderable quantity, not known.

TAN BARK AND TEASELS.

In some sections of the State, mainly in the north coast district, a species of oak tree is found, the bark of which is most excellent for tanning purposes. The bark is said to be superior to the oak bark used in the Atlantic States, as it contains a larger percentage of tannin, the entire thickness of bark being equally valuable. The value of this bark has been demonstrated so successfully that nearly two hundred thousand hides are tanned yearly, which mainly find sale in California and adjacent States and Territories, and considerable quantities are exported to China, Mexico, and other countries. The supply of this bark is said to be inexhaustible. Teasels of inferior quality grow wild in many portions of the State. Although of no pecuniary value for sale, they clearly demonstrate that the French teasel of commerce could be grown successfully.

WINES AND BRANDIES.

The cultivation of the grape in California is so general and extensive that the wine interest promises, at an early day, to exceed that of any other branch of agriculture in the State. The soil and climate have proved so well suited to vine growing, that at the present time the number of vines in California probably exceeds that of all the rest of the States combined. The returns of the County Assessors are so grossly

inaccurate in many cases that but little reliance can be placed on them for statistical information on which to base statements. Persons largely engaged in wine-making, and possessing good opportunities for judging, estimate the total number of vines and cuttings planted up to eighteen hundred and sixty-six at about thirty millions. Of these it is estimated that some eight million to nine million are bearing vines, the fruit of which is mostly made into wine and brandy. The total wine crop of eighteen hundred and sixty-six is estimated at about three million gallons of wine, and probably fifty thousand gallons of brandy, the heavy excise tax of two dollars per gallon on the latter causing a great increase in wine making, which would otherwise have found its amount seriously diminished by distillation into brandy. In previous years a large number of vine-growers made no wine, as brandy could be made readily, and at once find sale, which was not the case with wine. Planting of vineyards is going on at the rate of at least three million cuttings per year, and the produce of wine in ten years from date promises to exceed in value that of wheat, or, in fact, all the cereals combined. The native vine, or, rather, the Mission grape, was introduced by the Catholic priests when the Missions were founded. It is a large, blue grape, growing in large clusters, some of which have been exhibited weighing seven pounds. It is said to have been brought originally from Seville, Spain, is a vigorous grower, and bears abundantly in all parts of the State—the grapes, as a general rule, being larger in size when grown in the south coast district. Hardly an inhabited township in the valley counties can be found where the cultivation of this variety of grape is not engaged in. The making of wine is a common occurrence with thousands of persons, who make it for private use, and in small quantities. Although San Francisco County is not a vine-growing locality, there are at least thirty thousand gallons of wine made annually within its boundaries from grapes grown in other places and sent to the city for a market.

During a portion of August, and all of September and October, an average of five hundred boxes of grapes, of forty pounds each, are sold in San Francisco at prices ranging from one and one half to three cents per pound, used exclusively for wine making by Italians, Frenchmen and other persons engaged in gardening and fishing. Parties well informed on the subject estimate that from twenty-five thousand to thirty thousand gallons of wine were made in the County of San Francisco in eighteen hundred and sixty-six. The cultivation of the grape for wine making has become so general that there is hardly a county in the State that is without vineyards. A vast amount of land, hill slopes, rugged, rocky, and unfit even for ordinary pasturage, is being planted with vines, which, so far as tried, has proved of superior quality for grapes. In the Sierra Nevadas, below an elevation of two thousand five hundred feet, there is a belt of land almost valueless for ordinary agricultural purposes that will average twenty-five miles wide and between three hundred and four hundred miles long. The greater portion of this land will, in time, be planted in vineyards, as the wine produced is of a very superior quality.

In this connection it may be proper to divide the mountain vineyard lands of the State into three sections or classes, that the peculiar properties of the soil, the climate of each, and the wine made may be better described. I name them as follows: Los Angeles district, North Coast Range district, and the Sierra Nevadas. The wines produced in these districts from the same grape vary greatly, and are as distinct in their

classification as the wines of Spain and Portugal from those of France and Germany, and they in turn from the wines of Madeira and Teneriffe.

In the Los Angeles district, which comprises San Diego, San Bernardino, Los Angeles and Santa Barbara Counties, the wines as a general rule possess a large percentage of alcohol. The so-called white wine of this district has very little aroma, is quite heady, and generally of a golden tint rather than white. Port, Angelica and Muscat wines are produced in large quantities. The sweet taste of these wines is caused by the grapes being somewhat wilted or over-ripe when gathered, and the addition at a certain stage of making of from ten to twelve per cent. of brandy or pure spirits to prevent complete fermentation. By the latter the grape sugar is retained, which would otherwise be changed into alcohol. These wines are great favorites in some parts of California, where the percentage of spirits is often increased by consumers adding from one quarter to one half of proof native brandy when drinking. In this district a considerable quantity of sherry wine is produced. The process of making it is a forced one, a high degree of temperature being required to cook or ripen the wine to the desired bouquet and flavor. The vine having been planted in this section of the State when the Missions were created, in seventeen hundred and seventy-nine, its culture is not only older, but was more extensive, until within the past four years, than in any other district. The yield of wine is at the present time much larger than in the other districts, Los Angeles County alone producing, in eighteen hundred and sixty-six, between one million one hundred thousand and one million two hundred thousand gallons, the number of vines being reported at two million five hundred thousand, which is probably an underestimate. Assessors, in collecting statistics regarding agricultural products, have in many cases counted bearing vines only, which well informed men think has been the case in Los Angeles County. The wine growers of the Los Angeles District labor under many serious drawbacks not experienced in the other sections of the State. They are some three hundred to four hundred miles distant by sea, and have also considerable land transportation on their wines to the coast for shipment, their only market, aside from local consumption, being San Francisco. The freight is disproportionately heavy on the wine, while the empty casks, in the absence of suitable timber, having to be brought from the same port, renders their cost equal to full fifteen cents per gallon delivered at the vineyard. In the early days of wine making, when this district had a virtual monopoly of sales, the value of the wine was high enough to bear these expenses, and wine making was an extremely profitable pursuit. Competition from the other districts, however, has reduced the price of wine to such low figures that during the last four or five years prior to the laying of the excise duty of two dollars per proof gallon on wine spirits, quite a large portion of the grape crop was distilled into brandy.

This method of marketing their grape crop was especially advantageous to small vineyard proprietors, who thereby avoided the large outlay which would be required in the construction of cellars, vats and casks to ship wine in, and more especially the delay of from six to ten months, which their crop of wine would require before it was in a fit state to transport to market. The excise duty of two dollars per gallon bore especially hard on this class of men, who had either to sell their grapes at what they might be offered by the larger wine makers, feed them to hogs, or lose them altogether. With a low excise duty a very

large amount of brandy will be made, which, as it acquires age, will improve in quality and come into serious competition with that imported from France. Under the circumstances attending grape culture in the Los Angeles District, it is probable that the larger portion of the grape crop will ultimately be made into brandy, and form the great bulk of that spirit made in the State.

In the Coast Range district, which includes the whole of the coast range of mountains and valleys, are to be found the claret and sauterne wines of the Pacific Coast. The most noted locality for these wines is Sonoma County, where the cultivation of the wine rivals that of Los Angeles in extent. The general percentage of alcohol in wines is lighter than those of other districts, and the character of the wine made resembles greatly that of Bordeaux or the Rhine provinces, according as the quality of soil varies or method followed in making. The wines of this district also possess a better bouquet than those made elsewhere from the same variety of grape. While on this subject it is proper to state the only grape used in Los Angeles district for wine making is the Mission or Los Angeles grape. In the Coast Range district, and more especially in Sonoma County, there is a disposition among vineyard proprietors to introduce the culture of foreign varieties of grapes for wine making, and in some instances wine has been made from them of much improved flavor. The quantity of wine made from foreign grapes is, however, extremely small, and probably not over one per cent. in the product of eighteen hundred and sixty-six. The most of the foreign varieties, aside from those used solely for table purposes, have been found to be extremely shy bearers, and therefore unprofitable for wine making. A few varieties have proved excellent, producing large crops of grapes, equalling in quantity the Mission grape, which in some localities is a large bearer. This is peculiarly the case with the Black Zinfindel, said to be a Hungarian seedling of the Black Pineaux, the true champagne grape of France. The Black Zinfindel in Sonoma Valley makes a very fine red wine, resembling in looks, aroma and taste the finest brands of claret imported. The variety is so highly esteemed that it seems probable, from the demand for cuttings for eighteen hundred and sixty-seven, that in some sections of Sonoma County it will eventually take the place of the Mission variety as a wine grape.

Probably no wine country has such a variety of soil, often found in limited localities, as California. In the Township of Sonoma, which comprises Sonoma Valley, this is particularly apparent. In this valley, which is on an average less than three miles wide by eleven miles long, is to be found every variety of soil, ranging from a chalky gravel to a bright red volcanic loam. Where the soil is chalky the wines made are generally of a lighter color, and possess a smaller percentage of alcohol, both of which increase in amount as the soil varies towards the red tint. Some idea of the extent of grape cultivation in the valley may be formed from the Assessor's returns for eighteen hundred and sixty-six, which give the total number of vines of two years old and over as one million five hundred and fifty-five thousand three hundred and twenty-one. In making this estimate the Assessor based his calculations on an average of six hundred vines to an acre of vineyards, while the average proper should be about nine hundred. Very few vineyards had less than six hundred and sixty vines per acre, while in the majority of cases there were from eight hundred and eighty to one thousand three hundred vines. This style of making up returns is reported to be very common with County Assessors and their deputies. In Sonoma Val-

ley one Vinicultural Society has three thousand two hundred acres of vineland, some four hundred acres being in bearing. This society (the Buena Vista) made the first true sparkling wine in California, which brand has a good reputation as compared with the second class champagne wines of France. This wine was made from the native or Mission grape, and has not as good flavor as is expected from the foreign varieties just coming into bearing. Besides the claret and sauterne varieties common to this district, efforts are now being made to produce port and sherry wines; but the probabilities are against any very large quantity being made, as there is strong competition in these wines from the Los Angeles district. Should no unforeseen causes prevent, the wine crop of this district will in ten years exceed that of any other, the planting of new vines being in excess of the other two districts combined. Its proximity to the export market of San Francisco, with cheapness of freight and adaptability of soil for grape cultivation, plainly indicate that the wine crop within the time specified will equal, if not exceed, that of all other agricultural products in the district. The brandy made in this district, also, is freer from faults of flavor, and will in time be a favorite with consumers. During eighteen hundred and sixty-six there was made at least one million gallons of wine in the Coast Range district, and, with a good crop of grapes, the coming year will witness an increase of full fifty per cent. in the product.

The Sierra Nevada district possesses more land especially suitable for grape cultivation than any other. The range of mountains from Shasta to Santa Barbara, say twenty-five miles wide and three hundred and fifty miles long, has no superior, if any equal, for grape cultivation. The quality of the soil varies materially, but its predominating character is a red volcanic debris, which produces abundant crops of grapes. The climate is also free from those alternations of heat and cold during Summer which prevail in the Coast Range district, often damaging seriously the more tender varieties of grapes. In the Sierra Nevadas the Winters are longer, and as a consequence the Spring time freer from injurious frosts. The climate of the foothills is also drier, and during the Summer maintains an equable temperature, which to a high degree improves the flavor and matures the grape. This, combined with the absence of rains from April to November, gives the wine grower great advantages, which to a large extent offset the drawback of distance from an export market. With the construction of railroads through this section of the State the disadvantages of long transportation will in a measure be overcome and the soil and climate attract wine growers, while the quality of the wines will command the attention and favor of consumers.

The wines made in the Sierra Nevadas, as a class, resemble those of Madeira and Teneriffe. They contain a larger percentage of alcohol than any others, and have a peculiar delicacy of flavor not found in the wines of other districts. So far as known, it is almost impossible to make a claret or sauterne wine, although considerable wine made resembles the former but has a larger amount of tannin and alcohol in it. Port, sherry and some varieties of sweet wines are made which find a ready sale in the vicinity of the vineyards. Wine growers in this district vary greatly in their mode and treatment of wine, thus affecting the flavor of the wine produced, it being difficult to find two wines alike. A commendable feature in this district is the disposition of growers to propagate foreign grapes with a view to ascertain the best varieties for wine making. In this particular the district is far ahead of any other, and the result has been the making of superior qualities of wines, which

command with connoisseurs prices equal to those paid for the best imported varieties.

Among the wine growers who propagate foreign grapes, B. N. Bugbey, of Natoma Vineyard, El Dorado County, has been more prominent than any other, his experiments having been extensive and made regardless of expense. His vineyard at Natoma Valley, consisting of fifty-six acres of vines, contained seventy-two varieties of grapes, among which were to be found the rarest wine grapes of Europe. In eighteen hundred and sixty-five this gentleman made nineteen varieties of wine from as many different grapes. Of some of these the quantity did not exceed five gallons, but he was determined to test the quality of the different varieties with a view of selecting the best, and reducing the number from six to eight kinds. He succeeded in making excellent wines from the Los Angeles, Catalyac, White Pineaux, White Malaga, Red Traminer, Verdelho, White Riesling, Black Zinfindel, Black Prince, Flame-colored Tokay, Royal Muscadine, Fiher Zagos, White Tokay, Golden Chasselas and White Nice grapes. The Black Hamburg, Muscat of Alexandria, Catawba and Isabella made fair wines, but considerably inferior to the others. Out of the entire number, Mr. Bugbey selected five varieties to be cultivated in future, valuing them in the order named, the first being the best, viz: Black Zinfindel, Red Traminer, White Malaga, Verdelho and Los Angeles. These varieties were valued in a monetary view, the Verdelho making the best wine, while the Black Zinfindel produced the largest quantity of grapes. The results of these trials has greatly stimulated the propagation of foreign grapes in this district, and many years will not elapse before wines from foreign grapes grown in California will be seeking market in the cities of the Atlantic Coast.

GENERAL REMARKS.

In speaking of the wines of the various districts, I have given the general characteristics of the bulk made. In every section there are wines which resemble no foreign varieties known. As a rule, wine makers vary their wines by the time of picking, pressing, manner of fermenting and treatment while curing. As a consequence, there are scarcely two makes of wine of exactly the same flavor to be found. Wine makers have generally gained knowledge of their business through personal experiments only, the European mode of wine making not being adapted to the grape or climate. The success that has so far attended their efforts shows conclusively that in time the wines of California will not only supply the home demand, but come in vigorous competition with the wines of Europe in many foreign markets. From present appearances the wine interest of the Pacific Coast will, by the close of the present century, outrank in importance all the other agricultural products combined.

ADVANTAGES AND DRAWBACKS OF AGRICULTURE.

It is proper, before closing this article, to enumerate the many advantages our farmers have over those of other States, and the peculiar drawbacks incidental to California. In addition to the great superiority of climate, the vegetation in California is almost entirely free from the ravages of insect life, often so disastrous in the other States. With the exception of occasional irruptions of what are termed the army worm and grasshoppers, there is no insect life to injure vegetation. The rav-

ages of those named are seldom of any great extent, the sections of country where they prevail at any time being limited. One cause for the comparative freedom from insects is the dryness of the Summer season, and the immense quantities of small insect-feeding birds which are to be found all through the country. In many parts of the State, however, considerable damage is done to the grain crops by ground squirrels and gophers, which exist in great numbers. A little attention has already destroyed them in some sections, and the same care exercised by farmers generally would rid them of these pests. Another drawback is the high cost of transportation of produce to market, and the limited character of the home consumption compared with the crops raised. These difficulties, however, will vanish with the increase of population, which may reasonably be expected soon, and the construction of a network of railroads now projected and being constructed through many portions of the State.

THE GREAT WANTS OF CALIFORNIA.

The greatest want of the State, at the present time, is a large immigration. During the last ten years there has been comparatively little increase in the population. This state of things has been brought about by a variety of causes, which have prevented a flow of immigration on the one hand, and on the other drained the State of a large number of her best people. The Indian troubles on the Plains, high price of ocean travel, the late rebellion, and the efforts of immigration agents of the so-called Western States, at the Atlantic ports and Europe, have diverted the tide of population, which otherwise would have sought this State. The discovery of rich mining regions in adjacent States and Territories has drawn from California many of her best citizens, whose places have hardly been filled by immigration and natural increase up to the present time. California has contributed largely to the peopling of British Columbia, Oregon, Idaho, Nevada, Arizona and Montana. The aggregate of these drafts upon the population is very large, and not properly estimated or known to the mass of her people. They only see that the State has not increased in population, and that immigration is needed to restore the prosperity of other days. Fortunately the vast increase of home manufactures has given employment to a large number of people, and kept the money which was formerly sent out of the country to pay for these articles when imported. By this means, in connection with abundant grain and wool crops, a vast drain on the finances of our people has been avoided, which otherwise would have caused a paralysis or stagnation of business that would have been most disastrous in its effects. California only needs immigration to make her rank as one of the wealthiest States of the Union. She has room for five times her present population, who could be profitably engaged in developing her unrivalled resources of agricultural and mineral wealth. She needs more varied crops, more prudence in living, and industry among her people. Under the present system of farming our agricultural population are idle for nearly half the year, waiting either until nature prepares the land for ploughing, or the crops mature for reaping. As a rule there is no intermediate employment to occupy their time, or to profit their families. Nine tenths, or rather nineteen twentieths of our grain growers do not raise a potato or vegetable of any kind for their family or stock. The general excuse is it will not pay them to do so, and, as a consequence, they purchase of others at high prices. It will hardly seem

credible to the farmers of the Atlantic States that their brethren in California, while engaged in grain-raising, purchase their butter instead of making it themselves; yet this was a common habit a few years since. In eighteen hundred and sixty the writer visited a farm in Sutter County, about twelve miles from Marysville. The proprietor had one hundred and seventy head of fine American cows, which came daily to the barnyard; yet there was no milk for tea or coffee, and States butter was bought for family use. This was not an exception, but was the general rule in that section of country. California needs prudent, economical and enterprising immigration. Persons must not come with the expectation that fortune will smile on them without their personal efforts to succeed. To the honest, energetic and industrious there are opportunities to acquire wealth, either by farming, mining, or mechanics, that cannot be found in the other States. With the same energy, industry and prudence that are exercised by the population of the Middle States, California would, when properly peopled, outstrip in the value of her annual crops the States of New York, Pennsylvania, Ohio and Indiana combined. She has the area of soil, fertility and climate that, if taken advantage of, will make the statement above no vain boast, but a reality. To those who are seeking homes in the far West, with intent to gain a competence through industrious labor, I recommend California as presenting advantages not to be found elsewhere. To the idle and shiftless, it is the worst place to which they can come.

San Francisco, 1867.

STATISTICAL REPORTS.

STATISTICAL REPORTS.

The law requiring the County Assessors to report to the Surveyor-General also requires that officer to furnish the Secretary of the State Board of Agriculture with copies of such statistical reports as he receives from them. All of such reports having been carefully arranged in tabular form by the Surveyor-General, the table has been adopted as a whole for this volume of Transactions. The written reports of the County Assessors to the Surveyor-General, containing much valuable information as to their particular localities, are also copied in full. The Surveyor-General makes the following preliminary remarks:

"It affords me much pleasure to refer to the greatly improved condition of the statistical table accompanying this report, compared with those of other years; and while I believe all others to be exceedingly unreliable, except in regard to a few counties, I am fully convinced that the tables herewith presented give as correct an exhibit of the agricultural and industrial pursuits of the State as can be found in most of the older States.

"An examination of the total products of the great staples, wheat, barley, wine, wool, hay, potatoes, butter, etc., affords us ample assurance that should the time ever arrive when our mountain lodes and placers fail to respond to the sturdy blows of stamp, and pick, and shovel, our broad plains and rich valleys will furnish abundant employment, with equal and much more certain reward, for all who may desire the change.

"For many years the mining interests of the State largely preponderated over the agricultural; but that a change is rapidly and steadily taking place is abundantly shown by a comparison for a few years of the Assessors' valuation of those counties styled "mining counties" with those devoted almost entirely to agriculture.

"The value of the total production of a few of the leading staples of our State for the year eighteen hundred and sixty-six, so far as reported, may be summed up as follows:

14,080,752 bushels wheat at $1	$14,080,752
11,605,922 bushels barley at 45 cents	4,722,615
1,864,379 bushels oats at 50 cents	932,189
358,584 tons hay at $8	2,868,672
4,449,835 pounds butter at 30 cents	1,334,950
2,110,058 pounds cheese at 15 cents	316,508
5,229,826 pounds wool at 16 cents	836,772
1,791,633 gallons wine at 40 cents	716,653
1,983,068 bushels potatoes, sweet and common, at 60 cents	1,195,841
181,850 bushels peanuts at $3	545,550
242,213 bushels beans at $1 50	363,319
Total	$27,913,818

"In the above estimates of value I do not think that the quantity reported by the Assessors of a single product is large enough, except it may be the one article of barley.

"Wine, wool, hay, and potatoes, I believe to be much too small; yet it is several millions of dollars in excess of the gold product for the year eighteen hundred and sixty-six, which, from the most reliable information to be obtained, may be put down at twenty-four millions of dollars; and it is highly gratifying to know that as fast as the gold product of our State falls off, the increased agricultural product much more than makes up the deficiency.

"This is the first table prepared under the Act of March tenth, eighteen hundred and sixty-six, and when compared with former tables, it shows that imposing the duty of collecting these statistics upon County Assessors, with no reward for compliance and no penalty for neglect, utterly failed to produce the desired result, while this Act, by simply retaining twenty-five per cent. of the pay of Assessors until their reports were furnished, has supplied apparently good reports. Yet I firmly believe that if Assessors were allowed extra pay for collecting correct statistics, the result would be shown in further care in collecting and reporting.

"While much may be said in favor of nearly all the reports returned, it should also be said that several reports have come to this office, signed by the Assessors and certified to be correct by the Boards of Supervisors, which contained such gross errors, that although not acquainted with the counties except from general knowledge, I have seen the errors at a glance, and returned them for correction when they could not be corrected here.

"The examination required to be made by the Board of Supervisors is not a mere form; and I ask the several Boards, for the credit of their several counties, to carefully examine and criticise the reports before they approve them.

"The law should be amended so as to require the reports to be sent to this office on or before the first day of October of each year, instead of November first, the day on which the Surveyor-General is required to report to the Governor.

"I recommend also that in those counties having District Assessors, the County Clerk be required to receive and compile and return to this office, the entire statistics of the county.

"The work is now well begun and should not be suffered to go backward, but should be enlarged by increasing the facts to be reported, until every industry in the State is properly represented and presented in such form that the tables may be sought for and referred to as reliable information upon every matter reported."

TABLE OF STATISTICS.

Industrial and other statistical information for the year 1866, *as reported to the Surveyor-General by the several County Assessors, embracing the entire State, except the Counties of Fresno and Mono, and one township each in Amador and El Dorado.*

COUNTIES.	Acres of land inclosed.....	Acres of land cultivated....	WHEAT.		BARLEY.		Acres of land cultivated in 1867.....	Acres of wheat sown in 1867.	Acres of barley sown in 1867.
			Acres.....	Bushels..	Acres.....	Bushels..			
Alameda.....	139,444	71,356	38,792	1,091,760	31,099	967,920	83,467	53,190	14,378
Alpine.....	13,000	500	90	1,900	200	3,600	500	70	115
Amador (5 t'ps) ...	58,754	19,215	1,947	30,533	2,068	36,350	17,044	2,316	2,478
Butte.....	107,421	46,111	21,919	231,041	14,892	391,767	30,332	19,070	8,570
Calaveras	47,936	14,422	208	1,495	205	22,243	9,852	850	1,263
Colusa.....	125,640	46,440	15,647	24,340	21,010	413,140	51,500	24,200	20,140
Contra Costa.....	81,826	76,581	39,718	620,110	32,225	511,321	69,906	43,501	20,083
Del Norte	8,930	3,020	759	17,089	126	4,899	3,274	536	157
El Dorado (11 t'ps)	110,147	19,020	1,058	7,060	845	7,040	24,693	2,263	1,053
Fresno.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt.....	28,015	11,548	1,268	34,659	366	10,065	11,500	1,150	528
Inyo	977	470	72	1,372	115	2,961	1,167	395	317
Kern.....	5,680	1,791	100	2,600	868	27,776	1,850	75	1,100
Klamath.....	2,941	1,745	601	5,250	19	470	1,429	646	45
Lake.....	46,963	4,500	2,150	43,000	1,169	35,070	5,106	2,728	1,490
Lassen	12,000	9,000	400	6,000	2,500	40,000	5,000	400	2,500
Los Angeles	16,626	14,400	650	13,000	5,000	150,000	15,000	800	4,400
Marin.....	159,118	22,981	3,567	92,328	1,340	37,685	22,675	4,291	1,577
Mariposa	20,188	3,655	829	3,204	1,969	6,786	3,890	1,205	1,974
Mendocino.....	128,000	41,575	11,000	180,000	4,000	80,000	45,000	12,000	4,000

Merced	84,550	13,968	4,195	57,930	9,661	114,750	14,259	4,764	8,670
Mono	.....	.....	.....	.....	.....	.....	.....	.....	.....
Monterey	109,112	34,932	4,983	184,550	22,375	1,221,500	48,550	5,700	27,500
Napa	94,000	33,434	29,735	624,435	2,035	61,050	40,774	37,405	1,695
Nevada	52,890	21,288	525	2,350	.....	.....	21,575	450	600
Placer	60,155	26,002	4,416	77,311	4,198	61,736	22,867	6,867	2,318
Plumas	40,000	2,419	806	11,671	57	2,167	2,000	600	60
Sacramento	213,261	92,520	9,870	192,170	38,147	863,214	66,789	5,400	30,000
San Bernardino	13,721	11,108	1,498	27,449	1,924	59,177	11,108	1,849	9,259
San Diego	1,193	920	310	6,314	405	8,940	876	137	555
San Francisco	18,000	2,600	.....	.....	245	4,500	2,600	.....	250
San Joaquin	254,540	123,855	69,132	1,139,911	48,294	922,000	125,270	91,790	30,616
San Luis Obispo	22,520	2,969	1,225	24,500	612	18,360	3,123	1,318	663
San Mateo	130,000	60,000	20,000	420,000	8,600	258,000	55,000	16,000	5,000
Santa Barbara	10,161	6,550	50	900	1,450	5,025	6,550	50	1,450
Santa Clara	543,369	351,060	109,000	3,506,000	81,000	2,194,000	352,060	150,000	40,000
Santa Cruz	80,646	21,586	9,629	244,577	3,994	155,859	21,184	9,710	3,965
Shasta	59,325	34,216	7,314	87,768	7,000	189,000	26,740	7,314	7,000
Sierra	13,609	1,492	88	2,300	344	8,429	1,480	206	367
Siskiyou	5,852	13,373	4,545	81,156	1,692	54,899	11,506	4,503	1,978
Solano	480,000	175,800	141,150	2,117,250	21,000	525,000	200,000	160,000	18,000
Sonoma	247,306	101,247	35,023	581,241	15,716	231,115	101,247	27,943	12,376
Stanislaus	60,100	30,150	11,190	150,662	14,308	181,349	50,479	32,250	13,490
Sutter	109,063	45,424	15,732	269,050	18,655	400,246	47,109	21,730	13,937
Tehama	74,744	23,913	13,424	270,035	7,858	159,266	23,902	14,862	7,761
Trinity	10,679	3,328	1,022	13,959	104	2,212	2,607	1,298	241
Tulare	24,939	7,139	3,092	51,581	2,400	49,642	6,823	3,448	3,035
Tuolumne	43,669	10,536	817	9,925	1,510	9,500	10,060	1,112	2,160
Yolo	161,748	87,471	47,705	1,446,579	26,408	867,590	88,915	62,877	18,075
Yuba	73,373	26,697	4,554	72,447	12,613	228,303	24,643	7,308	7,685
Totals	4,207,131	1,774,327	690,745	14,080,752	472,621	11,605,922	1,793,286	846,377	354,873

TABLE OF STATISTICS—Continued.

COUNTIES.	OATS.		RYE.		CORN.		BUCKWHEAT.		PEAS.	
	Acres.....	Bushels.....	Acres.....	Bushels.....	Acres.....	Bushels.....	Acres.....	Bushels.....	Acres.....	Bushels.....
Alameda	4,854	211,499	201	4,560	320	7,640	70	972	175	2,981
Alpine	35	880	.....	.....	25	350	.....	.....	.....	20
Amador (5 town'ps)	14	435	12	143	199	4,975	17	268	½	50
Butte	78	1,887	267	1,355	391	13,967	.....	.....	.....	.....
Calaveras	9	140	1	38	169½	6,600	.....	.....	2	70
Colusa	50	1,200	.....	.....	.....	300	.....	.....	.....	.....
Contra Costa	2,198	93,431	59	1,010	305	4,213	15	398	21	401
Del Norte	645	27,819	.....	.....	21	475	1½	60	344	8,553
El Dorado	659	1,814	128½	1,339	56	1,220	.....	.....	2	40
Fresno	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt	3,844	177,785	.....	.....	321	8,026	9	259	1,344	53,760
Inyo	5	240	.....	.....	136	3,353	.....	.....	.....	.....
Kern	.....	.....	.....	.....	185	5,550	.....	.....	.....	.....
Klamath	308	6,010	22	450	44	1,375	4	80	61	1,661
Lake	149	5,960	22	.....	270	13,500	.....	.....	.....	.....
Lassen	1,900	30,000	20	400	15	200	.....	.....	6	180
Los Angeles	.....	.....	20	400	4,500	180,000	.....	.....	10	200
Marin	9,632	430,672	60	2,540	20	440	.....	.....	14	275
Mariposa	256	350	132	202	28	355	.....	.....	.....	.....
Mendocino	10,000	200,000	.....	.....	700	14,000	.....	.....	200	4,000

Merced	.....	.....	.....	.....	534	17,345	.....	.....	10	200
Mono	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Monterey	150	5,300	8	245	350	8,750	25	550	350	13,500
Napa	570	18,240	2	46	595	16,065	.....	.....	3	45
Nevada	.....	.....	.....	.....	.....	.....	.....	.....	10	.....
Placer	268	2,209	99	728	85	1,726	.....	.....	3	40
Plumas	1,456	57,064	2	47	6	110	.....	20	2	40
Sacramento	895	19,230	48	865	1,426	34,237	61	1,170	1½	45
San Bernardino	32	620	11	154	1,146	35,667	2	50	.....	.....
San Diego	2	40	.....	.....	135	3,038	.....	.....	12	240
San Francisco	590	1,400	.....	.....	.....	.....	5	125	15	150
San Joaquin	125	9,275	864	12,994	966	26,065	.....	.....	13	723
San Luis Obispo	5	.....	3	.....	600	27,000	.....	.....	10	.....
San Mateo	5,100	203,000	.....	.....	.....	.....	.....	.....	.....	.....
Santa Barbara	.....	.....	.....	.....	500	11,428	.....	.....	10	200
Santa Clara	800	3,890	27	640	428	31,070	150	2,000	40	450
Santa Cruz	1,137	56,033	19	450	489	16,895	66	1,735	20	240
Shasta	1,155	11,550	100	750	970	17,460	.....	.....	30	600
Sierra	567	12,384	.....	.....	2	85	.....	.....	.....	.....
Siskiyou	2,099	57,900	59	1,170	75	1,364	12	200	1¼	28
Solano	400	8,200	10	190	510	10,800	30	675	20	398
Sonoma	6,840	179,580	28	326	4,317	137,119	3	50	26	1,530
Stanislaus	.....	.....	.....	.....	560	15,560	.....	.....	.....	.....
Sutter	124	3,218	48½	754	612	20,828	45½	821	.....	.....
Tehama	89	3,027	.....	.....	80	2,385	.....	.....	½	85
Trinity	152	2,465	4½	27	45	1,000	.....	.....	3	62
Tulare	25	641	.....	.....	676	5,945	6	240	.....	.....
Tuolumne	140	800	20	390	15	450	.....	.....	15	282
Yolo	830	10,000	38	1,250	532	16,120	5	150	10	200
Yuba	396	8,281	26	630	794	24,150	.....	.....	5	110
Totals	48,583	1,864,379	2,361½	34,603	24,154½	749,201	527	9,823	2,791¾	91,359

TABLE OF STATISTICS—Continued.

COUNTIES.	PEANUTS.		BEANS.		CASTOR BEANS.		POTATOES.		SWEET POTATOES.	
	Acres.	Pounds.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.
Alameda			399	8,440	6	100	1,180	57,325		
Alpine			4	25			94	10,000		
Amador	2	4,500	7	158			45	7,327	7	1,590
Butte	12½	5,850					41	39,070	21½	33,425
Calaveras			78¾	2,487			56	6,340	⅛	15
Colusa										
Contra Costa			313	10,117			187	1,409		
Del Norte			5	20	197		197	25,298		
El Dorado			9½	140			96	5,970		
Fresno										
Humboldt			20	220			1,143	210,312		
Inyo			6	78			55	5,520		
Kern			13	520			25	5,000	7	1,750
Klamath			19	488			114	7,911		
Lake							40	2,000		
Lassen			25	400			125	2,500		
Los Angeles			500	5,000			1,000	250,000	20	1,000
Marin			19	465			3,244	230,853		
Mariposa			5	147			35	2,325		
Mendocino							1,200	180,000		

Merced			45	1,070			40	4,000	30	4,500
Mono										
Monterey			1,700	52,500			750	67,500		
Napa			6	240			14	1,260		
Nevada							104	7,530		
Placer	15	21,000	2	31			131	13,500	5	525
Plumas			1¾	140			87	12,480		
Sacramento	17	16,600	94	3,360			98	19,530	174	67,585
San Bernardino			25½	807			37	4,755	2½	380
San Diego			21	525			16	2,400		
San Francisco			20	300			1,100	45,000		
San Joaquin			13	495			212	25,572	43	5,895
San Luis Obispo			373	13,055	17		100			
San Mateo			300	6,000			2,000	120,000		
Santa Barbara			450	5,714	5		125	6,607	20	250
Santa Clara	2		160	2,140			270	18,000	½	20
Santa Cruz			595	13,286			576	89,950		
Shasta	2½	300	153	3,482	1	1,120	126	7,125	62	2,122
Sierra							95	9,353		
Siskiyou			3¼	58			71	11,187	4	800
Solano		10	85	2,550			230	21,500	150	19,300
Sonoma			17	630			3,300	241,192		
Stanislaus			12	350			15	2,400		
Sutter	1¾	2,030	102	2,035	51	28,000	20	2,541	47½	5,148
Tehama	25	6,100	7	245			56	8,315	18	3,265
Trinity			30	585			114	16,375		
Tulare	1	100	3	150			55	6,935	27	2,915
Tuolumne			11	335			90	8,783		
Yolo	97	121,370	67	2,087	3	4,000	67	3,570	56	5,280
Yuba	4	4,000	61	1,338	15	2,300	110	8,083	19	2,700
Totals	189¾	181,850	5,781¾	242,213	295	35,600	18,886	1,834,603	714⅛	158,465

TABLE OF STATISTICS—Continued.

COUNTIES.	ONIONS.		HAY.		FLAX.		HOPS.		TOBACCO.		Tons of beets.....
	Acres.....	Bushels.....	Acres.....	Tons.....	Acres.....	Pounds.....	Acres.....	Pounds.....	Acres.....	Pounds.....	
Alameda	91	8,520	9,140	14,390	82	8,200	14	4,000	.....	.....	1,370
Alpine	1	10	500	600	.....	.....	.....	.....	.....	.....	5
Amador	2½	200	6,126	6,701	.....	.....	2⅛	1,610	.....	.....	4½
Butte	6	1,825	7,499	9,438	.....	.....	.....	.....	.....	150	20
Calaveras	7½	411	7,614	16,074	.....	10	.....	5	3	1,630	898
Colusa	.....	.....	900	1,100	.....	.....	.....	.....	.....	.....	.....
Contra Costa	16	384	14,967	21,537	11	278	.....	.....	21	22,816	1,173
Del Norte	1	90	397	862	.....	.....	.....	.....	.....	.....	1
El Dorado	4	212	8,913	7,158	.....	.....	½	320	.....	100	5
Fresno	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt	.....	23	1,382	3,646	½	270	.....	.....	.....	40	66
Inyo	2	60	546	1,105	.....	.....	.....	.....	.....	.....	3
Kern	4	1,071	587	1,134	.....	.....	.....	.....	.....	.....	3
Klamath	2	28	391	746	½	*1,000	.....	.....	.....	.....	.....
Lake	5	500	1,269	2,903	.....	.....	.....	.....	.....	.....	.....
Lassen	9	270	4,000	4,000	.....	.....	.....	.....	.....	.....	10
Los Angeles	10	2,000	200	400	.....	.....	12½	17,000	10	.....	20
Marin	8	2,000	5,047	8,360	.....	.....	30	6,000	.....	.....	451
Mariposa	2	205	1,250	2,794	.....	.....	.....	.....	.....	.....	.....
Mendocino	.....	.....	14,600	17,000	.....	.....	75	.....	.....	.....	.....

Merced	5	1,000	1,791	2,188							
Mono											
Monterey	600	2,400	850	1,670					25	15,210	50
Napa	4	675	6,975	7,975							95
Nevada			10,000	12,000							
Placer	2	92	9,220	6,793			Fraction	400		275	77
Plumas	1½	80	5,073	7,009							30
Sacramento			26,269	22,327			36	38,300			133
San Bernardino	4¼	1,017	884	2,478					3	1,715	46
San Diego	10	400	325	872							3
San Francisco	20	600	200	335							100
San Joaquin	13	2,947	14,629	13,657							20
San Luis Obispo	3			2,134							2
San Mateo	100	5,000	10,000	10,000							
Santa Barbara	20	225	990	990					2		15
Santa Clara	20	1,000	16,000	30,000			76	100,000	50	5,000	8,000
Santa Cruz			3,403	8,028	47	*3,533	1	300			
Shasta	31	4,100	3,600	3,600			2	500	3	750	14
Sierra	4	200	5,200	6,049							15
Siskiyou	4½	801	3,210	5,997							10
Solano	30	5,350	26,000	23,500					7	3,300	350
Sonoma		130	23,147	21,964			42	13,435	16	9,000	81
Stanislaus			3,530	3,450							
Sutter			6,913	8,339			2	1,000			
Tehama	5½	989	4,321	4,738							3
Trinity	5	701	1,297	1,937							8
Tulare	5	200	749	1,300							
Tuolumne	12	940	3,525	3,680							3¾
Yolo	35	6,300	10,141	15,669					1	1,500	163
Yuba	7	830	12,186	9,956			21	18,042	2	1,531	3
Totals	1,113	53,786	295,716	358,584	141	*Seed.	313⅝	200,912	143	63,017	13,251¼

TABLE OF STATISTICS—CONTINUED.

COUNTIES.	Tons of turnips	Tons of pumpkins and squashes	COTTON. Acres	COTTON. Pounds	Pounds of silk cocoons.	Acres of broom corn	Pounds of butter	Pounds of cheese	Pounds of wool	Pounds of honey
Alameda	138	971					89,772	5,251	222,473	4,285
Alpine	25	5					16,000		1,064	80
Amador	3	18				36	15,065	2,025	10,300	5,140
Butte	35	40					24,955	500	128,472	16,420
Calaveras		23					21,735	1,664	13,937	7,484
Colusa		5				10	40,000		288,000	15,000
Contra Costa	903	3,501				17	85,431	21,802	187,981	18,030
Del Norte	3	10						97,945	1,690	1,196
El Dorado	9	12					106,210	22,237	12,028	1,950
Fresno										
Humboldt	31						42,130	3,500	1,500	985
Inyo	19	36					3,340	2,000		
Kern	7	45					4,760	2,000	99,387	500
Klamath							2,625		900	1,220
Lake		60					3,000	61,000	11,000	6,420
Lassen	8	11					45,000	10,000	7,500	
Los Angeles	30	500				10	100,000	10,000	405,000	50,000
Marin	23	7					1,337,500	378,600	3,300	1,890
Mariposa							8,405	295	14,414	
Mendocino							20,000	10,000	100,000	5,000

Merced		200					9,715	1,340	373,000	2,935
Mono										
Monterey	70	450				2	369,920	220,400	347,580	9,410
Napa	17	115				80	108,000	3,100	26,430	6,560
Nevada										7,500
Placer	98	86				27	36,805	4,650	35,055	6,800
Plumas	80	30					138,115	780	1,200	
Sacramento	127	1,312				212	379,350	12,000	269,365	15,519
San Bernardino	56	585	2	150		28	73,612	46,610	41,864	26,494
San Diego	4	153					2,410	3,125	51,216	
San Francisco	90	30					1,000	3,500		75
San Joaquin	23	20				2½	325,615	9,465	130,618	26,775
San Luis Obispo	½	6					25,345	120,000	283,504	21,640
San Mateo							30,000	75,000		
Santa Barbara	10	20			120		6,460	4,450	587,500	2,500
Santa Clara	2,000	12,060			150	26	200,000	543,000	74,000	10,000
Santa Cruz		1,109					163,750	322,400		1,090
Shasta	21	28					11,450	320	50,000	1,550
Sierra	46	5					32,450	1,800		590
Siskiyou	33	55					56,450	11,210	7,200	5,790
Solano	275	375				20	60,000	15,000	280,000	2,500
Sonoma		247					148,390	61,437	73,281	13,178
Stanislaus						50	8,560	6,000	264,600	6,000
Sutter	17	745				1,009	83,506	1,600	88,140	26,631
Tehama	3	6½				97	23,967		335,887	6,896
Trinity	29	44					19,325	50		745
Tulare		50				5	7,425	4,070	156,650	7,500
Tuolumne	10	7				10	24,500	2,300	7,900	3,375
Yolo	34	2,593			6	884	97,020	7,940	162,680	26,244
Yuba	5	44			20		48,667	702	32,210	8,905
Totals	4,272½	25,619½	2	150	296	2,525½	4,449,835	2,110,058	5,184,826	382,492

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of apple trees...	Number of peach trees...	Number of pear trees....	Number of plum trees....	Number of cherry trees..	Number of nectarine trees	Number of quince trees..	Number of apricot trees.	Number of fig trees.....	Number of lemon trees...	Number of orange trees..	Number of olive trees...
Alameda.....	170,473	36,543	56,094	30,429	23,706	3,742	3,995	1,915	579	157	209	308
Alpine	25	80	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Amador	26,945	30,762	3,821	4,016	1,018	5,400	658	1,001	536	11	14	1
Butte	18,009	39,066	1,409	809	576	590	90	1,588	1,242	.....	21	12
Calaveras.....	42,729	15,424	11,070	2,627	1,083	1,026	1,055	1,260	1,212	5	11	1
Colusa.....	16,000	20,000	3,000	1,700	540	870	176	572	355	.....	14	.....
Contra Costa...	29,181	16,908	8,438	4,622	3,105	227	2,017	740	591	21	73	26
Del Norte.....	9,974	515	707	433	260	1	29	11	1	.....	.....	.....
El Dorado.....	136,857	58,882	26,727	6,308	957	1,564	1,292	905	834	14	7	2
Fresno	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt.....	39,997	718	1,828	2,384	985	4	219	31	14	.....	7	.....
Inyo..... ...	41	1,062	1	1	2	.....	.....	4	.....	.....	.....	.....
Kern	124	350	20	.....	.....	.....	.....	.....	20	.....	.....	.....
Klamath.....	2,598	1,116	87	55	60	1	21	7	.....	.....	.....	.....
Lake.....	5,018	4,178	810	807	139	36	23	36	9	.....	.....	.....
Lassen.....	500	700	200	100	100	.....	.....	50	.....	.....	.....	.....
Los Angeles....	6,927	8,917	6,023	240	128	252	550	1,718	1,878	1,842	8,799	604
Marin.....	30,164	1,486	1,369	1,294	865	50	294	66	51	6	.....	.....
Mariposa.....	6,232	5,860	725	409	164	93	81	176	212	.....	.....	.....
Mendocino.....	16,800	9,600	2,240	1,920	960	400	180	50	.....	.....	.....	.....

Merced	10,314	5,811	1,326	527	136	140	62	301	337	.....	1	4
Mono	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Monterey	6,071	1,942	1,928	387	308	311	27	431	72	.....	.....	7
Napa	63,818	35,382	15,995	5,955	4,995	565	1,885	1,605	605	25	18	50
Nevada	20,545	18,180	4,634	906	792	890	500	265	240	.....	35	.....
Placer	35,463	24,957	11,536	2,839	1,231	910	1,632	973	724	2	9	.....
Plumas	2,500	3,200	608	165	61	4	18	12	12	.....	.....	.....
Sacramento	93,303	89,067	36,830	12,603	3,709	3,999	2,698	10,541	3,890	149	108	34
San Bernardino	6,963	14,220	833	1,063	96	84	303	506	463	83	202	32
San Diego	188	592	217	57	20	12	24	141	151	11	76	380
San Francisco	1,549	.....	600	350	200	10	5	.....	10	.....	.....	.....
San Joaquin	47,673	46,591	8,917	4,311	1,272	1,257	613	3,347	2,942	.....	.....	.....
San Luis Obispo	3,336	1,296	1,074	507	222	67	189	317	127	.....	.....	275
San Mateo	30,000	7,000	6,000	3,500	2,500	1,500	900	800	200	.....	.....	.....
Santa Barbara	17,000	6,500	3,500	480	800	900	800	1,500	2,200	400	750	10,500
Santa Clara	210,000	97,600	82,000	64,000	57,000	3,000	3,600	4,260	400	12	126	60
Santa Cruz	41,479	3,788	3,994	2,618	1,253	78	357	503	91	.....	7	5
Shasta	231,251	219,400	111,000	43,000	21,000	16,400	7,450	9,225	678	65	19	7
Sierra	4,403	2,882	750	331	255	47	74	17	7	1	1	... .
Siskiyou	20,061	8,118	1,105	992	677	139	119	31	12	.....	.....	.....
Solano	33,000	41,500	8,575	4,400	3,200	750	700	12,870	18,500	60	75	500
Sonoma	117,303	38,437	16,283	10,421	3,927	1,179	2,720	1,366	1,183	138	448	19
Stanislaus	5,017	3,069	1,164	476	210	160	80	360	523	.....	10	.....
Sutter	10,953	15,321	3,085	1,377	323	632	230	966	943	4	.....	1
Tehama	7,344	21,090	1,998	1,315	424	408	100	623	474	2	18	4
Trinity	16,154	6,400	2,656	1,051	341	116	127	76	8	.....	2	.....
Tulare	5,939	17,429	1,309	672	205	162	52	393	162	.....	.....	.....
Tuolumne	25,489	41,789	8,840	3,595	3,867	1,920	3,126	1,545	1,690	3	66	.....
Yolo	29,430	31,351	12,148	2,997	2,114	1,253	723	2,800	2,351	9	136	46
Yuba	39,846	33,959	9,011	5,168	2,132	2,100	2,551	2,411	1,318	9	21	3
Totals	1,694,986	1,088,038	482,477	234,280	147,918	53,249	42,345	68,315	47,847	3,029	11,284	12,881

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of fruit trees	Number of mulberry trees	Number of almond trees	Number of walnut trees	Number of gooseberry bushes	Number of raspberry bushes	Number of strawberry vines	Number of grape vines	Gallons of wine	Gallons of brandy
Alameda	755	228	1,694	518	142,573	1,214,614	6,887,430	155,070	6,544	.....
Alpine	.....	.....	.....	.....	50	100	500	.....	.....	.....
Amador	42	19	221	73	3,922	8,168	68,023	757,773	78,357	100
Butte	4	126	382	65	153	3,560	56,881	369,785	15,375	1,900
Calaveras	4	100	271	248	2,162	9,017	755,727	505,049	36,783	452
Colusa	.....	26	18	8	.....	.....	242	47,800	40	.....
Contra Costa	76	17	229	950	4,865	4,391	2,895	201,518	19,301	12
Del Norte	.....	12	1	31	12,470	36,382	47,750	120	.....	.....
El Dorado	57	14	551	289	9,786	25,858	187,975	1,441,039	235,680	6,998
Fresno	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt	.....	.....	73	52	5,613	29,163	42,886	839	113	.....
Inyo	.....	.....	.....	.....	.....	.....	110	252	.....	.....
Kern	.....	.....	.....	.....	.....	.....	.....	3,800	.....	.....
Klamath	.....	.....	.....	.....	825	451	11,632	2,917	75	.....
Lake	.....	.....	63	30	384	30	2,250	11,000	.....	.....
Lassen	.....	.....	.....	.....	100	.....	1,000	200	.....	.....
Los Angeles	.....	200	427	3,508	.....	5,000	312,120	3,000,000	600,000	70,000
Marin	2	1	50	17	657	327	760	11,542	2,000	.....
Mariposa	.....	27	11	.....	237	1,210	28,750	51,783	2,895	.....
Mendocino	.....	.....	.....	100	10,000	6,000	18,000	15,000	.....	.....

Merced	3	68	20	2	125	100	18,500	100,740	10,910	320
Mono										
Monterey	78	20	105	27	583	421	1,127	84,839	1,500	350
Napa	35	15	270	380	5,335	2,425	5,070	1,166,935	82,185	340
Nevada		50	44	34	9,300	23,000	140,000	124,000	10,000	500
Placer	40	132	332	100	5,764	35,920	182,027	397,101	36,744	1,759
Plumas					32	272	56,440	1,616	10	
Sacramento	172	2,075	1,460	1,666	7,929	16,967	167,523	951,315	63,879	5,714
San Bernardino	50	16	300	401	714	4,257	118,805	312,562	49,680	4,361
San Diego			20	7	12		300	1,915	1,410	
San Francisco					320	100	30,000	75		
San Joaquin	402	65	358	117	1,115	443	15,685	493,387	23,347	500
San Luis Obispo				12	58	60	221	18,263		
San Mateo			200	150				16,000		
Santa Barbara	500	7,500	8,500	2,400	150	500	15,000	220,000	27,100	1,700
Santa Clara	600	2,516	1,000	150	15,000	40,000	12,000,000	2,000,000	40,000	4,000
Santa Cruz	119	7	81	93	1,332	3,088	67,450	218,100	1,200	
Shasta	16	13	1,943	362	1,237	11,421	13,460	1,535,420	6,348	1,819
Sierra		11	10	13	630	2,727	1,845	4,737	400	
Siskiyou	4	21	4	3	1,935	4,411	16,905	8,469	70	
Solano	40	100	1,850	1,300	3,500	250	3,440	950,600	84,350	5,470
Sonoma	243	193	5,208	2,994	20,854	4,872	71,203	2,830,195	199,030	6,838
Stanislaus			26	20			5,500	112,310	12,528	200
Sutter		67	171	147	50	1,000	2,977	163,663	16,290	500
Tehama	3	14	61	25	420	77	110,780	145,883	3,292	100
Trinity		4	17	5	3,754	10,532	127,158	19,096		
Tulare			28	52	200		22,700	100,950	2,300	2,000
Tuolumne	100	58	90	90	1,890	24,600	48,480	505,250	47,980	2,400
Yolo	336	420	2,110	530	278	63	14,564	157,434	18,637	5,687
Yuba	11	260	441	302	7,661	20,304	293,459	494,472	55,280	3,120
Totals	3,692	14,395	28,640	17,271	283,975	1,551,081	21,975,550	19,710,814	1,791,633	127,140

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of horses	Number of mules	Number of asses	Number of cows	Number of calves	Number of beef cattle	Number of oxen	Total number of cattle
Alameda	5,291	407	8	3,052	1,445	1,327	427	6,251
Alpine	188	9	2	293	116	79	86	574
Amador	1,721	129	11	1,330	766	826	147	3,069
Butte	3,649	410	600	.....	.....	.....	.....	6,340
Calaveras	1,667	199	39	1,597	823	726	288	3,444
Colusa	6,546	370	40	9,000	6,000	4,000	180	19,180
Contra Costa	7,869	391	32	6,503	3,001	1,213	187	10,904
Del Norte	359	68	2	742	622	718	111	2,193
El Dorado	4,018	596	56	2,461	1,787	1,730	728	6,706
Fresno	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt	4,728	699	17	5,728	5,426	2,835	516	14,505
Inyo	281	38	41	304	266	426	82	1,078
Kern	2,651	183	60	482	400	989	398	2,269
Klamath	287	293	12	291	239	786	76	1,392
Lake	6,181	86	6	1,206	1,009	1,250	76	3,541
Lassen	1,000	100	.....	1,200	1,200	4,000	400	5,600
Los Angeles	10,941	706	149	2,019	1,500	13,414	319	17,252
Marin	2,766	113	6	13,747	2,329	3,374	623	20,073
Mariposa	1,509	207	51	987	987	2,092	214	4,280
Mendocino	7,000	500	25	3,200	2,800	4,000	940	10,940

Merced	3,117	235	40	19,242	9,640	1,242	22	30,146
Mono	.....	.....	.....	.....	.....	.....	.....	.....
Monterey	4,134	107	10	2,785	763	9,564	95	13,207
Napa	4,595	425	22	1,920	1,355	2,680	180	6,135
Nevada	1,963	205	4	1,348	147	925	292	2,712
Placer	3,877	470	13	1,417	902	1,395	520	4,234
Plumas	1,366	179	50	1,948	600	2,198	244	4,990
Sacramento	8,873	1,828	27	5,782	2,217	3,733	412	12,144
San Bernardino	2,474	408	39	2,004	1,606	888	318	4,816
San Diego	3,718	249	52	1,126	1,084	19,173	250	21,633
San Francisco	7,439	150	.....	4,048	87	20	40	4,195
San Joaquin	8,836	830	23	4,400	2,743	5,670	382	13,195
San Luis Obispo	3,283	65	31	4,050	1,230	10,171	69	15,520
San Mateo	2,000	80	50	2,000	1,000	3,000	500	6,500
Santa Barbara	2,948	248	33	5,174	2,122	4,010	149	11,455
Santa Clara	6,892	700	28	4,117	1,600	4,000	200	9,917
Santa Cruz	1,617	78	7	3,327	2,098	2,294	396	8,115
Shasta	1,335	1,942	14	2,325	1,300	1,476	498	5,599
Sierra	455	98	5	724	628	1,151	294	2,797
Siskiyou	4,125	517	26	2,259	961	12,982	372	16,574
Solano	8,440	1,470	10	3,780	2,400	7,875	160	14,215
Sonoma	7,840	793	41	8,224	4,037	5,849	763	18,893
Stanislaus	2,751	255	12	814	711	3,693	55	5,273
Sutter	3,569	804	4	2,487	2,363	1,051	267	6,368
Tehama	3,403	396	23	2,942	2,096	2,573	91	7,702
Trinity	464	151	11	631	419	353	138	1,541
Tulare	7,694	287	35	1,471	.....	29,561	566	31,597
Tuolumne	1,330	270	107	1,285	699	1,115	609	3,707
Yolo	4,480	1,976	69	2,492	1,372	4,604	302	8,770
Yuba	2,246	590	26	1,924	1,409	1,321	168	4,822
Totals	189,907	21,310	1,969	150,198	78,305	188,352	14,150	436,363

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of sheep	Number of Cashmere and Angora goats	Number of hogs	Number of chickens	Number of turkeys	Number of geese	Number of ducks	Number of hives of bees
Alameda	37,485	5	5,375	50,334	7,255	982	16,239	548
Alpine	266	32	226	500	25		9	21
Amador	5,216	130	3,992	14,717	1,678	473	524	346
Butte	37,000	55	16,620	20,097	4,478	221	326	895
Calaveras	8,719		5,333	26,553	1,155	371	1,071	506
Colusa	101,228	2	20,900	47,200	14,000	200	875	1,444
Contra Costa	27,089	17	23,815	16,100	1,642	915	1,192	1,301
Del Norte	345	3	2,027	3,037	42	13	267	117
El Dorado	6,586	197	4,747	20,037	1,706	492	517	894
Fresno								
Humboldt	1,082	19	10,467	10,014	284	136	58	359
Inyo	1,072		96	1,148				
Kern	39,755		760	9,000	65	40	130	113
Klamath	598		1,228	1,508	55		15	62
Lake	5,742	11	5,519	10,080	359	172	108	643
Lassen	3,000		400	3,000	400		200	50
Los Angeles	135,000		4,000	200,000	2,000	1,200	2,500	687
Marin	1,119		4,203	1,528			2,452	51
Mariposa	6,529	857	4,177	10,832	1,225	106	784	2
Mendocino	26,000		24,500	60,000	2,500	300	4,500	1,000

Merced	79,487	258	12,483	5,560	464	137	229	321
Mono								
Monterey	86,520		3,232	9,574	317	205	483	472
Napa	11,215		5,790	21,150	5,470	180	850	820
Nevada	618		1,450	13,282	2,100	105	273	310
Placer	1,245		5,891	10,284	2,657	59	463	675
Plumas	468		965	8,400	68	16	64	8
Sacramento	49,996		11,339	30,523	8,168	1,939	1,721	773
San Bernardino	12,573	24	3,220	6,911	174	240	544	1,345
San Diego	12,804		626	3,086	37	44	34	18
San Francisco	11		5,625	4,652	190	208	1,759	8
San Joaquin	26,278	650	13,000	66,000	10,750	640	5,125	1,579
San Luis Obispo	70,876		1,507	8,565	424	41	107	541
San Mateo	1,500		2,000	8,000	1,000	300	500	
Santa Barbara	104,358		703	10,000	700	60	550	500
Santa Clara	24,000	3	10,000	20,000	2,000	300	10,000	1,000
Santa Cruz	1,106	4	5,629	18,180	381	378	507	351
Shasta	11,421		11,768	14,000	4,298	229	542	298
Sierra	934		734	4,201	225	89	178	38
Siskiyou	14,912		4,493	16,912	427	267	404	598
Solano	35,600		12,300	27,500	1,800	340	1,675	435
Sonoma	29,827		19,217	51,906	3,263	1,693	5,738	795
Stanislaus	75,600	200	6,127	23,650	7,323	447	3,400	1,000
Sutter	20,680		6,798	27,263	4,394	371	1,271	774
Tehama	78,933	58	12,456	20,198	3,019	83	323	590
Trinity	121		609	3,855	120	51	38	214
Tulare	70,152	166	8,802	12,624	880	108	723	460
Tuolumne	3,000	7	3,900	15,480	2,570	114	750	376
Yolo	59,166	52	14,644	32,331	2,598	217	736	2,305
Yuba	9,517	3	8,356	30,807	8,433	735	2,556	1,570
Totals	1,346,749	2,753	332,049	1,030,579	113,119	15,217	73,310	27,204

TABLE OF STATISTICS—Continued.

COUNTIES.	GRIST MILLS.				Barrels of flour made.....	Bushels of corn ground...	SAW MILLS.		Feet of lumber sawed.....	No. of shingles made.....
	Steam power.....	Run of stone.....	Water power.....	Run of stone.....			Steam power.....	Water power.....		
Alameda	3	14	2	4	53,540	1,775	.....	.....	.....	.....
Alpine	.....	.....	.....	.....	.....	.....	4	6	440,000	.....
Amador	1	3	2	3	2,700	1,300	1	1	340,000	.....
Butte	1	3	3	6	66,000	6,700	7	3	3,500,000	.....
Calaveras	.....	.....	.....	.....	.....	.....	6	7	481,290	87,000
Colusa	2	3	.....	.....	12,000	.....	2	.....	204,000	....
Contra Costa	3	11	.....	.....	11,000	797	.....	.....	.....	.....
Del Norte	2	2	.....	.....	100	4,000	2	1	110,000	6,000
El Dorado	1	2	2	2	4,025	1,000	15	12	10,407,000	718,000
Fresno	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt	2	2	1	1	2,448	770	6	2	18,942,583	500,000
Inyo	.....	.....	.....	.....	.....	.....	.....	1	75,000	39,000
Kern	.....	.....	.....	.....	.....	.....	2	1	2,555,000	85,000
Klamath	.....	.....	2	2	700	100	1	4	1,293,880	.....
Lake	.....	.....	2	3	1,500	200	2	4	405,895	200,000
Lassen	.....	.....	2	4	1,200	100	1	5	1,800,000	.....
Los Angeles	.....	.....	3	5	2,600	60,000	.....	.....	.....	.....
Marin	.....	.....	.....	.....	.....	.....	2	.....	922,000	.....
Mariposa	.....	.....	.....	.....	.....	.....	7	.....	1,500,000	200,000
Mendocino	2	3	5	5	11,200	2,000	9	6	49,600,000	1,500,000

Merced			3	6	7,500	1,000				
Mono										
Monterey	2	2			1,580					
Napa	2	5	2	3	33,400	9,500	2	1	365,000	27,000
Nevada	1	4			6,000		18	4	2,000,000	700,000
Placer	1	2			2,250		14	6	9,000,000	
Plumas			2	3	1,200	50	2	18	2,000,000	
Sacramento	3	13	2	4	832,196	164,700	1		610,000	
San Bernardino			2	4	9,000	3,000	3		1,800,000	
San Diego			1	1						
San Francisco	8	20			247,708	7,520	8		8,950,000	
San Joaquin	6	18			81,000	5,725				
San Luis Obispo										
San Mateo	1	2	1	2			6	2	4,000,000	20,000,000
Santa Barbara	1									
Santa Clara	10	27	2	4	75,000	200	8		4,690,000	600,000
Santa Cruz	2	5	4	7	21,750	5,500	10	10	10,000,000	11,400,000
Shasta			2	4	6,000	4,000		11	24,512,900	
Sierra							16	16	3,200,000	
Siskiyou	3	5	4	7	9,200	2,200	3	5	1,600,000	425,000
Solano	2	4			16,580	575				
Sonoma	8	15	5	5	4,450	2,700	4	6	8,000,000	1,370,000
Stanislaus			2	5	30,000	10,000				
Sutter										
Tehama	1	3	3	8	26,000	1,250		2	225,000	
Trinity			1	1	875	18	1	17	1,085,000	50,000
Tulare	1	2	1	2	10,250	1,500		1		100,000
Tuolumne	1	2	2	5	4,375	180	8	4	2,325,000	420,000
Yolo	2	5	1	2	31,000	3,200				
Yuba	2	10	1	4	31,000	16,000	13	4	12,000,000	
Totals	74	187	65	112	1,655,327	317,760	180	160	188,938,648	38,427,000

TABLE OF STATISTICS—Continued.

COUNTIES.	QUARTZ MILLS.		MINING DITCHES.			IRRIGATING DITCHES.		WOOLLEN MILLS		COTTON MILLS.		Tons of coal mined.....	RAIL ROADS.	
	Number.....	Tons crushed.....	Number.....	Miles in length...	Amount of water used per day. Inches.....	Number.....	Acres irrigated...	Number.....	Pounds of wool used.....	Number.....	Pounds of cotton used.....		Number.....	Miles in length...
Alameda										1	100,000		6	31
Alpine	3					10	500							
Amador (5 dist's)	25	99,700	27	428	10,910									
Butte	5		15	68	1,300								1	13
Calaveras	41	46,598	41	552	6,263	37	419							
Colusa														
Contra Costa												63,350	3	15
Del Norte			21	40	1,830	3	115							
El Dorado (11 townships.)	27	37,243	43	629	10,167	15	2,751						1	19½
Fresno														
Humboldt													1	2
Inyo	7	4,700				18	655							
Kern						12	670			1				
Klamath	3	2,000	62	74	14,122	25	406							
Lake														
Lassen														
Los Angeles						15	8,000							
Marin														
Mariposa	34	15,000	10	66	4,600	60	163							
Mendocino														

Merced						4	1,100						
Mono													
Monterey													
Napa													4½
Nevada	68	105,000	51	850								1	5½
Placer	8	2,800	37	715	12,100	3	22					3	134
Plumas	20	24,999	208	198	16,800	32	1,000						
Sacramento				28¾	7							4	57
San Bernardino	2		4	4		95	3,818						
San Diego	2												
San Francisco	1							2	3,500,000	1	10,000	6	27
San Joaquin						2	3,000						
San Luis Obispo													
San Mateo												1	25
Santa Barbara													
Santa Clara						2	2,000					2	25½
Santa Cruz													
Shasta	5	1,465	58	284	12,000	73	4,069				8		
Sierra	18	20,000	32	127	13,200	15	232						
Siskiyou	3	1,000	13	200	3,600	2	570						
Solano													
Sonoma												1	3
Stanislaus			3	14	400								
Sutter													
Tehama			1	7	160	33	409						
Trinity				299	38,050	74	650						
Tulare						50	4,000						
Tuolumne	30		9	263		3	230						
Yolo						6	2,560						
Yuba	8	10,775		106	5,584	24	472	1				2	20
Totals	310		635	4,952½		617	37,813	3	3,500,000	3	110,000	63,358	82	382

TABLE OF STATISTICS—Continued.

COUNTIES.	ASSESSED VALUE OF PROPERTY.				Estimated total population	Registered voters	Poll tax collected
	Real estate	Improvements	Personal property	Total valuation			
Alameda	$5,741,536		$1,737,064	$7,478,600	14,101	2,726	$6,417
Alpine	234,470		121,936	356,406	500	391	312
Amador (5 dist's)	837,779		692,549	1,530,328	8,400	1,718	2,119
Butte	1,295,482		1,428,057	2,723,539	7,200	2,787	4,740
Calaveras	884,353		655,088	1,539,441	11,300	3,042	2,660
Colusa	779,849		1,300,981	2,080,830	4,000	1,109	900
Contra Costa	1,618,566	$53,271	1,002,126	2,673,963	8,341	1,876	2,300
Del Norte	65,270	105,964	245,818	417,052	985	349	902
El Dorado (11 t'ps)	324,925	1,666,526	1,599,749	3,591,200	12,353	3,851	6,467
Fresno							
Humboldt	401,485	364,220	870,371	1,636,076	7,650	1,263	1,120
Inyo	71,800	9,695	114,932	196,427	300	227	454
Kern	29,450	64,594	715,781	809,825	2,650	831	1,767
Klamath				332,164	2,500	375	1,535
Lake	61,275	124,908	284,155	470,338	4,000	806	938
Lassen				530,807	1,000	353	175
Los Angeles	1,089,529	59,738	1,204,000	2,353,267	8,700	2,175	1,000
Marin	1,585,892		855,122	2,441,014	4,723	1,111	2,304
Mariposa	400,100	473,209	542,574	1,415,883	8,500	1,615	3,097
Mendocino	276,031	225,100	1,277,654	1,778,785	7,500	1,752	2,060

Merced	224,287	134,730	874,845	1,233,912	1,900	412	824
Mono							
Monterey	483,698	160,045	571,740	1,215,483	5,180	641	1,475
Napa	2,252,002		1,070,258	3,322,260	8,575	1,809	2,211
Nevada	2,748,373		2,428,464	5,176,837	18,000	5,185	9,204
Placer	1,515,955	194,850	1,980,926	3,691,731	16,550	3,636	62,546
Plumas	75,534	485,965	696,616	1,258,115	6,500	1,723	3,722
Sacramento	4,437,324	537,005	4,469,272	9,443,601	15,000	6,084	7,294
San Bernardino	403,574	167,557	321,118	892,249	2,725	767	720
San Diego	133,777	41,250	364,798	539,825	2,630	237	301
San Francisco	49,138,027		39,264,246	88,402,273	125,000	20,672	45,720
San Joaquin	2,295,281	1,312,165	2,076,659	5,684,105	16,000	4,018	2,371
San Luis Obispo	189,513	49,260	368,667	607,440	2,200	590	107
San Mateo	940,421		397,300	1,337,721	3,500	940	1,404
Santa Barbara	512,045		259,816	771,861	5,000	808	600
Santa Clara	3,101,055	2,373,506	2,598,338	8,072,899	16,000	4,815	7,338
Santa Cruz	864,182	503,796	788,776	2,156,754	8,000	1,947	2,524
Shasta	372,035		650,318	1,022,353	5,200	1,474	2,300
Sierra	769,687	236,435	1,331,799	2,337,921	7,000	2,508	4,716
Siskiyou	206,187	266,375	1,045,447	1,518,009	6,000	2,107	4,164
Solano	1,617,000	950,000	1,475,000	4,042,000	15,000	2,930	3,400
Sonoma	1,940,167	1,249,787	2,630,173	5,820,127	28,147	5,214	6,584
Stanislaus	518,960	3,060	682,254	1,204,230	2,050	796	850
Sutter	278,628	643,427	923,354	1,845,409	2,820	1,504	2,956
Tehama	305,480	243,554	1,082,329	1,631,363	3,000	944	1,124
Trinity		238,704	368,012	606,716	3,272	1,050	1,502
Tulare	449,005		850,374	1,299,379	4,820	1,205	800
Tuolumne	523,850	444,610	798,485	1,766,945	6,700	2,488	2,400
Yolo	805,392	410,355	1,174,485	2,390,232	9,125	1,682	3,120
Yuba	580,550	1,513,106	2,047,756	4,141,412	10,000	2,938	4,940
Totals	$93,379,737	$15,306,817	$88,239,582	$197,789,107	470,597	119,481	$288,494

REPORTS OF COUNTY ASSESSORS.

ALAMEDA COUNTY.

H. W. CRABB.....County Assessor.

HAYWARD'S, August 5th, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: In conformity with the law, I have the honor to submit the following report, which is as nearly correct as is possible to obtain. The principal productions of this township are wheat and barley. The crop is fully one fourth below the average yield of favorable seasons. The heavy rains in the Winter prevented early sowing, and the lack of the usual Spring rains caused the grain to be thin and in many places very weedy; the latter, however, might be more properly attributed to overworking the land. The present practice of cultivating the land in grain every year in succession will eventually prove ruinous to both land and cultivator. The land requires enriching, and in our dry climate manure is almost impracticable. Our only recourse appears to be by pasturing, volunteering for hay, or Summer fallowing. The rolling gravelly soils and the low adobe lands might be Summer fallowed once in three years, say one third each year, and the alluvial soils be volunteered and cut for hay, and in both cases to pasture closely with sheep. By this method the farmer could dispense with one third or more of his teams and hired help, have steady work for those he keeps, clean his land and enrich it, and get more grain from the two thirds he cultivates, of better quality and with less expense than he now does from the whole, and have a crop of hay and the increase of a small flock of sheep besides.

The number of acres cultivated is about the same as in eighteen hundred and sixty-six, with some variation in the relative proportion of acres sown to wheat and barley, there being in wheat, in eighteen hundred and sixty-six, nine thousand four hundred and forty-one acres, and in barley nine thousand one hundred and twenty-four, the former yielding an average of about twenty bushels per acre (being struck with rust) and the latter about sixty; whereas, for the year eighteen hundred and sixty-seven, there have been sown to wheat twelve thousand nine hun-

dred and twenty-five acres, and but five thousand six hundred and forty-six to barley, the former averaging about twenty-five bushels per acre and the latter about forty-five—making the quantity of wheat raised in eighteen hundred and sixty-seven nearly double that of eighteen hundred and sixty-six, and the quantity of barley less than half that of eighteen hundred and sixty-six. Considerable quantities of cherries and currants are raised, for which this locality is peculiarly adapted, they being the finest in the market and very remunerative to the grower. There are about twenty-four hundred trees of the former, and about ninety-seven thousand of the latter. From three to five thousand tons of salt are manufactured annually along the eastern shore of the bay. There are six school houses, costing in the aggregate fifteen thousand dollars. The rate of taxation for State and county purposes, per one hundred dollars, is two dollars and twenty cents. Estimated population nineteen hundred and seventy-two; number of registered voters, four hundred and three; number of poll taxes sold in eighteen hundred and sixty-six, five hundred and fifty-nine. Many permanent improvements have been made during the past year, and our township gives evidence of future prosperity that cannot fail to be gratifying. Our fine soil, climate and proximity to San Francisco make this one of the most desirable localities in the State.

All of which is respectfully submitted.

H. W. CRABB,
Assessor Eden Township, Alameda County.

COLUSA COUNTY.

S. H. SMALL ....County Assessor.

ASSESSOR'S OFFICE, COLUSA COUNTY,
Colusa, October 30th, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: In compliance with your order and the law, I herewith transmit my annual report to you. Farmers, stock raisers and merchants have all been prospering very well since my last annual report. This county has increased rapidly in population. There has been a vast amount of land bought for different purposes. Real estate throughout the county has increased in value. The town of Colusa has increased to a considerable extent; several good buildings have been erected. There are two companies prospecting for oil; one is down several hundred feet, while the other is tunnelling in the hill. My statistics are as near correct as I could obtain.

Very respectfully, your obedient servant,

S. H. SMALL,
County Assessor of Colusa County.

DEL NORTE COUNTY.

T. B. THORP.....County Assessor.

CRESCENT CITY, DEL NORTE COUNTY,
August 14th, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: Inclosed with this I send you the statistical report for this county, which you will find has been approved by the Board of Supervisors.

Hoping it will meet your approbation also, I subscribe myself,

Yours, respectfully,

T. B. THORP,
County Assessor.

HUMBOLDT COUNTY.

STEPHEN GOFF.....County Assessor.

OFFICE COUNTY ASSESSOR,
Eureka, September 10th, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: In conformity to the law and in compliance with your circular, I submit my annual report for the year eighteen hundred and sixty-seven, which is as full and correct as I have been able to ascertain by diligent investigation. Although not as full as could be desired, still it approximates somewhat near the facts.

There has been an increase in the various productions of the county over last year, the principal productions being wheat, barley, oats, hay and potatoes. There has also been an increase in the various kinds of live stock, as horses, mules, asses, hogs, and sheep; and a decrease in stock cattle, owing to the great number driven to other parts of the State. You will observe by this report that there has been a decrease in the assessed valuation of all kinds of property, which is caused by the failure of the coal oil interest in the county.

The crops of all kinds will be an average in this county this year.

All of which is respectfully submitted.

Yours, respectfully,

STEPHEN GOFF,
County Assessor.

INYO COUNTY.

JOHN T. RYAN.....County Assessor.

ASSESSOR'S OFFICE,
Independence, Inyo County, October 14th, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: I have the honor to transmit to you the statistics of this county. This report will give but an imperfect idea of the growing importance of this part of our State. The following may be some of the causes that retarded the development of this new county:

Argentiferous galena being the first kind of ore discovered, the successful working of which was purely experimental, this, coupled with the unjust spirit of quartz speculation, destroyed the confidence between the prospectors and capitalists. This discouraged persons from coming here; and the hostile Indians, emboldened by our lessened numbers, bid defiance, and caused a further drain of our population. New discoveries being made, the mining interest was enhanced; farmers gathered to cultivate a fertile soil to meet the demands of the miners; cattle men drove their herds here, where abudance of fodder and a warm wintry climate invited them; the hammer of the artisan and the sound of the mill stamp drowned forever in silence the echoes of the Indian war-whoop. An untraversed region is left open for the prospector, and his discoveries are marked now by little thriving mining camps that spring up on every side of the fertile valley. New saw mills are in course of erection; a flouring mill fills its little niche in the development of our resources. It is only within a year that an impetus has been given to our industry; and an air of permanent security is worn by our business men. Inyo has doubled her population within that period. Her future greatness is written on her geographical position, her soil, mines and salubrious climate. Announce to all her importance in our State. Placed as she is under the snow-capped Sierras, they pour their first water over her bosom, bathing her in verdure, which contrasts beautifully with the sombre and leaden color of the great desert that binds Owen's River Valley to the east.

This great desert is broken up by various ranges of mountains which contain, according to recent discoveries, metals of all kinds. This desert in future will be the home of many miners; and no other soil than this valley being in that region, extending hundreds of miles to the east, and about the same distance north and south, this must eventually become the market place of a large population.

Our free gold mines are paying remarkably well, the many methods of treating sulphurets having increased the confidence in the richness of our silver mines.

Agricultural, cattle and mining interests will about contribute equally to the wealth of this county. Arable land, of which there is an abundance, is fast settling up. The crop of last year has proven that all kinds of fruit can be grown. Sickness finds no congenial place here,

and the inhabitants of the county are well contented with their isolated position, for they hold with themselves everything that can contribute to make a people happy.

Yours, respectfully,

JOHN T. RYAN,
County Assessor.

KLAMATH COUNTY.

WM. CHILDS.....County Assessor.

ORLEANS BAR, KLAMATH COUNTY,
August 3d, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: I herewith transmit to your office my annual report, accompanying which you will find a statistical report of all such matters as can be obtained with any degree of correctness.

The assessed value of all taxable property for the present year is three hundred and thirty-two thousand one hundred and sixty-three dollars and seventy-eight cents; giving an increase over last year of forty-two thousand seven hundred and seventy-four dollars and seventy-four cents.

The prospects in the mining portions of the county are flattering, and several rich claims have been struck.

Of the three quartz mills in the county only one has been in operation, and still continues to yield large returns.

There is a decided improvement in the returns from the sections of the county adapted to stock raising and agriculture, and which may steadily increase from year to year.

There is considerable attention directed to the manufacturing of lumber on the sea coast, but it does not increase with that facility which might otherwise occur if the available lands were surveyed.

From the best information I can gather the total population of the county is about twenty-five hundred, made up of whites, Chinese and Indians.

Respectfully yours,

WM. CHILDS,
Assessor of Klamath County.

MARIN COUNTY.

R. SHEARAR.....County Assessor.

COUNTY ASSESSOR'S OFFICE,
Marin County, October 22d, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: Inclosed you will find statisticul reports for the year ending January first, eighteen hundred and sixty-seven, and in relation to them I have only to say that I have obtained a full statement of the products of each and every tract of land in the county from the best authority I could find on the premises. The amount of land in beets, turnips, etc., was so small that I made no account of it in footing up the sum total of lands cultivated.

The finances in the county are in a healthy state; the Road Fund is considerably in debt, however. The want of roads has called forth during the past year an urgent appeal from all parts of the county for expenditures or appropriations to be made on the highways.

The crops of the county will not compare as favorably with other sections of the State this season as they have, pretty generally, heretofore.

Very respectfully, your obedient servant,

R. SHEARAR,
County Assessor.

MENDOCINO COUNTY.

B. J. MCMANUS.....County Assessor.

MENDOCINO COUNTY,
August 1st, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: Herewith I transmit my statistical report for eighteen hundred and sixty-six. Our Board of Supervisors will not meet for some two weeks yet, and as they reside many miles from the county seat of this county, it is not convenient for me to get their approval. I hope it may make no material difference. My report gives hops seventy-five acres. In some cases the figures approximate as near as they could be made, it being impossible to arrive at the exact figures. However, in most particulars it is right.

Hoping the report may meet with your entire approbation, and that a certificate to that effect may be sent by your office,

I remain, very truly, your obedient servant,

B. J. MCMANUS,
County Assessor of Mendocino County.

MONTEREY COUNTY.

W. V. McGarvey. ....County Assessor.

Assessor's Office,
Monterey County, August 22d, 1867.

Hon. J. F. Houghton,
Surveyor-General:

Sir: According to law I forward to you my report for the year ending December thirty-first, eighteen hundred and sixty-six, on the resources of this county. A comparison of the statistical tables with those of the preceding year will show that the agricultural condition is improving, and that the value of property, real and personal, is on the increase.

The land inclosed since eighteen hundred and sixty-five is seven thousand acres, and the land improved since then and put under cultivation amounts to eleven thousand acres. These improvements have chiefly taken place on ranchos where the agricultural lands have been parcelled out and rented in lots of one hundred acres, more or less, the diminution of stock allowing the land owners to dispose in such manner of their lands not needed for grazing purposes.

The lower part of the Salinas Valley is where most of these improvements have taken place, and during the year eighteen hundred and sixty-six that section has surpassed in fertility all others in the county; and this will ever be the case where there is no want of rain, while in a dry year the Pajaro Valley is superior. However, the fertility of the Salinas Valley only extends to Township Fifteen south, including the same; further up the valley the aspect changes, and the country, except on some sheltered spots, becomes unproductive as to agriculture, and only fit for grazing purposes, the high winds there prevailing from May to November every day, from ten A. M. till sundown, and blowing at times with such violence as to send over the plain clouds of dust, sand from the river bed and even pebbles, rendering all agricultural attempts fruitless. This part of the valley is, notwithstanding, valuable for stock and sheep raising, and during the Spring is covered with alfileria and clover, while late in the season the tough and nutritious bunch grass, thriving well in dry and stony soil, and seeming to be a plant created for such locality, able by its slenderness and flexibility to withstand the severe Summer blasts, affords to cattle the best pasturages.

Good grazing lands on the Salinas and in the vicinity of Monterey have since eighteen hundred and sixty-five greatly increased in value; several large tracts of land have been rented for dairy purposes to persons lately from Marin county, and by them a large number of valuable stock have been introduced. The dairy business contributes greatly to the prosperity of this county. The products of this branch of industry during the year eighteen hundred and sixty-six, as may be seen by the tables, has been large, but much of the stock being introduced late in the season, those of eighteen hundred and sixty-seven will greatly exceed them.

The Pajaro Valley has not been so productive as the beginning of the year promised, and late rains have injured large crops of wheat in that section.

The farming lands in the vicinity of the Town of San Juan have pro-

duced fine crops. Some of them, for fertility, can vie with any in the State.

The crops of eighteen hundred and sixty-six have generally been satisfactory; but the barley crop has excelled all others, having surpassed that of all previous years—even that of eighteen hundred and fifty-three—which was heretofore considered as the best known. The wheat crop of the last named year has, until now, not been equalled.

The yield of fruit has not been superior to that of the year previous. Of late the number of fruit trees has greatly augmented, particularly in the neighborhood of Monterey City. It is, however, obvious that they will not thrive so well where they are exposed to the sea air as in some localities more sheltered, and where less fogs prevail. At present, fruit is raised only for home consumption, and even a large quantity is yearly imported.

Cattle and sheep have decreased during these last two years, but their breed is improved, and consequently their value augmented; there is little left of the old Spanish stock. The breed of horses is likewise improving, their number remaining about the same.

In most parts of the State some attention has been paid to the raising of bees, but owing to the many casualties they are subject to in their domestic state, they do not increase as well as could be desired. Bees have been raised here since eighteen hundred and fifty-eight and eighteen hundred and fifty-nine. Before that time there were but a few hives in the county, probably not numbering over a dozen. At present, the Santa Lucia Mountains, and the almost inaccessible ridge along the coast between Monterey and San Simeon, are swarming with wild bees; and there they seem to thrive a great deal better than in the hives whence they emigrated. Some parties, among whom are experienced hunters, are at present are engaged in collecting honey in these mountains. This business, although it may be profitable, is not always carried on without difficulty, as the bees often select for their location some redwood trees of large dimensions in parts not easy of access. The felling of such trees cost excessive labor, and it is not uncommon for them to break in falling, shattering the combs and rendering the honey valueless.

The product of the whale fishery is gradually diminishing; the whales are getting very shy, and on their passage up and down the coast they give the Bay of Monterey a wide berth. There are still three companies, numbering in all fifty-two men, engaged in whaling; two of these companies are established on the Bay of Monterey, and the other on the Bay of San Carmelo. The number of whales caught in eighteen hundred and sixty-six was seventeen, making about eight hundred barrels of oil. Other fisheries are not carried on upon a large scale except by the Chinese, who make such wholesale destruction of fish on this part of the coast as to render them very scarce. Their way of fishing is by means of ground lines, called *trolls*, having several hundred of fishhooks attached; these are set in deep water along the ledges of rocks, and the fish not being migratory, when caught in large numbers without intermission are in a few years entirely destroyed. The Chinese at Monterey and Carmelo cure yearly, for exportation to China, two hundred tons of fish; formerly, when fish were abundant, they exported about five times that quantity. During the Summer months they catch great numbers of sharks for their fins and livers. They also export yearly great quantities of shell-fish (*halyotis;*) the latter, like the rock fish, they have almost entirely destroyed, depriving thereby the destitute inhabitants of the sea coast of one of their most reliable means of subsistence.

Mackerel, heretofore so plentiful, seem to have abandoned this bay. Formerly a great number of persons came yearly to engage in the mackeral fishery, but this fish has not been seen here since eighteen hundred and sixty-three. There is among the fishermen some diversity of opinion as to the cause of their not making their periodical appearance as before; some ascribe it to shoals of caracoutas that have been observed for these last years in greater numbers than before and during all seasons about the entrance of the bay, preying on all kinds of smaller fish and keeping out the mackerel; others, to the absence of shrimps and small fry the mackerel feed on and in search of which they visit this bay. Those who are of the latter opinion account thus for the disappearance of the fry:

Various kinds of small fish and shrimps locate and breed in the kelp edging the shores of the bay, particularly in the most sheltered places where the sea is smooth, and among these are the so called "kelp fish" (of the perch kind, but viparious); this fish is insipid in taste and altogether valueless in our market; the Chinese, however, catch large quantities of them and ship them off, together with other kinds. Their way of catching them is by setting gill nets along the kelp and then beating the water with long poles and drumming on boxes or boards, creating as big a noise as they possibly can, thereby driving the fish out of the kelp into their nets. By this they also drive away the fry, and when the mackerel make their appearance—only visiting the bay in search of food—not finding any, they naturally leave.

Whatever may be the cause, I believe that in order to prevent the total destruction of all kinds of fish on the California coast a protective law should be passed by the Legislature, and that as early as possible. This could be easily done by prohibiting, under certain penalties, *all persons* from setting ground lines or trolls with more than twelve fish hooks, except for sharks (which are caught on sandy bottom and with a different kind of gear); beating the water with poles and drumming when fishing with gill nets in the Bay of Monterey and other sheltered harbors or coves, and also the curing of shell fish for exportation.

Considering that the Legislature passed an Act prohibiting the killing of worthless hair seals or sea lions on Point Lobos, I am under the impression that that body should likewise take into consideration a matter like this, which at least is of some importance to parties depending on the fishery for their support and maintenance, and that a law protecting the fisheries on the California coast would have more beneficial effects than that alluded to for the protection of sea lions; and certainly the matter would be considered if the time of the legislators was less absorbed by their own interests and those of their particular friends than by those of the people they are or rather should be representing.

Having by my statistical report hereunto annexed complied with the law, I will take the liberty of saying a few words concerning it. In my report of last year I made a few remarks on the unjustness of the same in exacting from officers an arduous duty without allowing them a compensation therefor, and attaching a penalty in case of neglect; and now can but repeat that which I then remarked, and add that the Assessor of this county receives no other fees or compensations than those provided by law for the performance of his official duties, and if it is believed that those compensations are ample to remunerate him for his labor in taking and compiling these statistics requested of him, I would

call the public attention to that preposterous fee bill for Monterey County going into effect on the first of March, eighteen hundred and sixty-eight (which fee bill, it must be stated, was not created as a measure of economy—and this will be understood by any one who knows that the taxpayers in this county are taxed to the amount of three dollars and fifteen cents per one hundred dollars—but was prompted by the sordidness and insatiable greed of parties interested in the speedy redemption of the county bonds), and make no further comments on the subject.

An object of no less mortification is, that after so much unpaid labor is exacted from Assessors, the contemptible indifference exhibited towards them in the distribution of the reports and other publications of the Department of Agriculture at Washington. In each of those reports we read of how many copies of those publications and of how many packages of seeds have been distributed to members of Congress, etc., to be by them distributed among their particular or political friends, who, by the way, are generally very little concerned about such matters. Now, I believe that Assessors, whose business it is made by law to procure from farmers those agricultural statistics used for the compilation of the general reports, could make some good use of those objects distributed by the Department aforesaid, and then when so much is exacted from them, the poor courtesy of furnishing them with copies of those reports should be the least that could be bestowed on them, if no more.

Were I asked the question how this could be attained, I would answer, that the Surveyor-General, in order to encourage the Assessors in the performance of the duties the law and himself exacts from them, should procure a sufficient number of copies of all the publications already mentioned, and likewise a share of the articles yearly distributed in the manner aforesaid, and should furnish therewith every County and District Assessor in the State.

Submitting these remarks, I have the honor to be,

Your obedient servant,

W. V. McGARVEY,
Assessor of Monterey County.

By J. RUURDS, Deputy.

SAN DIEGO COUNTY.

JOHN L. McINTIER.....County Assessor.

ASSESSOR'S OFFICE,
San Diego County, October 24th, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: In compliance with the law, I herewith beg leave to transmit to your office my annual report of statistics, etc., of San Diego County; boundaries, north by Los Angeles and San Bernardino Counties, east by the State line and Mexican boundary, south by Lower California, and west by the Pacific Ocean.

There are two whaling companies in our bay; last season's catch amounted to some thirty thousand gallons. Our bay cannot be surpassed on this coast; completely land-locked, with a depth of water sufficient to float the largest vessel in the world; it is fourteen miles in length, and from one to three miles in width.

The lands of the county will produce as fine grapes, figs, olives, and oranges, as any county in the State. Wheat grows remarkably well, the grain being decided by wheat growers to be the largest and finest in the State.

In the mountainous districts, immense fields of barley are raised, which, by the way, is sold to emigrants, mostly coming into our State by the northern route.

The grape production is beginning to attract some attention. Tobacco has been tested and found to grow well.

By way of improvements, we have a new road opened to Fort Yuma, lessening the distance some thirty or forty miles, and cutting off nearly fifty miles of the desert. A little more money expended would make it one of the best mountain roads in the State.

We have but two schools in the county, owing to families living too far apart.

All of which I have the honor to submit for your consideration,

JOHN L. McINTIER,
County Assessor.

SAN FRANCISCO COUNTY.

WM. R. WHEATON..... .....City and County Assessor.

ASSESSOR'S OFFICE,
San Francisco, August, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: Herewith I hand you supplemental report of statistics of the manufactures and mechanical industries of this city and county for the year eighteen hundred and sixty-six. In making up this report in conformity with the Act of eighteen hundred and sixty-six, requiring information to be collected and reported annually to the Surveyor-General of the State, I have endeavored to return the same in such form as will best give a correct idea of the extent and value of the various products manufactured, and so far as possible the quantities of material used. I have also attempted to gather such information as would enable me to estimate and report the condition of manufactures as compared with the previous year, as well as the relative financial prosperity of the manufacturers.

In this as well as in other inquiries I have experienced great difficulty, owing to the natural reluctance of manufacturers to give data concerning the prospects or results of their business; the confounding by many persons of my office with that of the Assessor of Internal Rev-

enue; and last, though not least, the insufficiency of the law, which requires me to procure the information desired under a heavy penalty, yet provides no means to enforce a compliance on the part of manufacturers and others engaged in the different branches of trade. In this connection I would respectfully suggest that you recommend to the next Legislature an amendment to the Act above referred to, so that this deficiency of the law may be remedied. The matter of correctness in statistical information concerning the industrial resources of the State is a most important one, not only for business estimates to our own people, but to encourage immigration from abroad. From a variety of causes not necessary here to mention, a gross ignorance of the resources of California prevails in the Atlantic States as well as in Europe; and, in my opinion, no more efficient means to furnish proper information in these respects can be had than an official publication of the variety and extent of those mechanical industries of which this city and county is the great centre. Men intuitively reason by comparison; and from the prosperity, variety and extent of our domestic manufactures, the most ignorant can by inference alone form a pretty correct idea of the state of society and the business advantages that California offers as inducements for the industrious and worthy to settle within her territory. Where the olive, fig, almond, orange and citron grow, men know that the climate must be favorable to physical health; so where manufactures and mechanical industries largely prevail, a moral bond is given for the good order and intellectuality of the people.

So far as I could learn from the parties applied to, their manufactures during the year eighteen hundred and sixty-six as a whole have been more extensive than in preceding years. Their prosperity in a money point of view has as a general thing been also greater, but in many branches of trade parties complain that competition has been stronger and profits smaller than heretofore. No prominent branch of trade, however, has been seriously affected, while many new and important manufactures have been or are about to be introduced. The most prominent of these is the rolling mills for copper and iron, the works being reported to be of a capacity sufficient to supply all the manufacturers of those metals upon the Pacific Coast. In addition to the rolling mills and forge at present being constructed, I am informed that it is contemplated in time to add copper smelting works for the reduction of low grades of ores, and that in case iron ore of a suitable quality, abundance and cheapness can be found to work, an iron furnace will be joined to the establishment.

Another great want of California has been supplied in eighteen hundred and sixty-six by the erection of a linseed oil mill, which has a manufacturing capacity sufficient to supply the entire States and Territories of the Pacific Coast.

A new branch of woollen manufactures is also about to be commenced, which will give employment to several hundreds of people, and supply a great want in the manufactures of the State. This is the Pacific Woollen Mills, which will make all varieties of woollen and mixed knit goods used by our people. The mill has been erected and the machinery set up ready for use, the latter consisting of seven sets of cards, four mules, twenty-seven knitting machines and sixteen hundred spindles, the whole being driven by a one hundred horse power engine, and estimated to require an annual consumption of eight hundred thousand pounds of wool to keep it constantly employed. Besides this new mill, both the

other woollen mills have largely increased their manufacturing capacity by additional buildings and machinery during the past year. Among other important works erected in eighteen hundred and sixty-six is a dry dock at the Potrero, with a capacity to dock vessels of one thousand five hundred tons register, and a stone dry dock at Hunter's Point, with a capacity to dock any known vessel now afloat except the Great Eastern and the Dunderberg. The latter dock is expected to be ready for use some time in the latter part of eighteen hundred and sixty-seven, and when completed, from its size and convenient location, will make the Port of San Francisco much resorted to by the larger vessels on the Pacific Ocean when needing important repairs.

The facts connected with manufactures and mechanical industries for eighteen hundred and sixty-six, so far as I can learn, indicate a degree of prosperity decidedly encouraging; and I should judge that the statistics of eighteen hundred and sixty-seven, when taken, will show a healthy increase over those of the preceding year.

The following is a list of manufactures; where the articles were too small or varied to mention, the value is set down; only new goods or manufactures are reported:

Flour Mills	8
Men employed	84
Flour made in 1866, barrels	247,708
Pearl barley, tons	50
Hominy, tons	50
Farina, tons	25
Oatmeal, tons	50
Groats, tons	13
Buckwheat and rye flour, barrels	1,000
Feed barley, ground, sacks	25,000
Run of stone	20
Total daily capacity of mills, barrels flour	1,850
Horse power of engines	515
Saw Mills	8
Lumber sawed, feet	8,950,000
Saws run	38
Men employed	142
Horse power of engines	256
Salt Mills	5
Men employed	30
Domestic salt, ground, tons	2,400
Foreign salt, ground, tons	1,800
Run of stone	6
Horse power of engines	70
Rice Mills	2
Men employed	13
Rice cleaned, pounds	7,658,873
Capacity to clean paddy per day	70,000
Horse power of engines	80

Woollen Mills	2
Men employed	725
Horse power of engines	300
Sets of cards	21
Mules and jacks	28
Looms	80
Spindles	8,000
Blankets made, pairs	110,000
Broadcloths, cassimeres and tweeds, yards	185,000
Flannel, yards	850,000
Wool used, pounds	3,500,000
Wadding Mill	1
Men employed	12
Horse power of engines	35
Cotton used, pounds	10,000
Iron Foundries and Boiler Shops	14
Men employed	1,018
Pig iron used, tons	6,921
Bar iron used, tons	1,448
Sheet and boiler iron used, tons	1,027
Rivets of iron used, tons	110
Iron Doors, Shutter and Safe Shops	6
Men employed	44
Sheet iron used, tons	151
Bar iron used, tons	262
Brass Foundries	4
Men employed	62
Value of manufactures	$95,000
Lead and Shot Works	1
Men employed	18
Quantity of lead manufactured, tons	1,000
Quantity of shot made, tons	200
Capacity of works per year, tons	4,000
Cordage Factory	1
Men employed	47
Horse power of engine	150
Hemp manufactured, tons	1,000
Capacity of works per year, tons	1,750
Wire Rope Manufactory	1
Men employed	3
Value of manufactures	$23,000
Saw Teeth Manufactory	1
Men employed	9
Value of manufactures	$12,500

Saw Manufactory	1
Men employed	9
Value of manufactures, three months	$3,000
Glue Manufactory	1
Men employed	10
Glue made, tons	16
Neatsfoot oil made, gallons	5,000
Capacity per day for glue, barrels	10
Capacity per day for oil, gallons	200
Oil Refinery	1
Men employed	3
Oil refined, gallons	60,000
Capacity of works per day, gallons	4,000
Pianoforte Manufactory	1
Men employed	2
Pianos made	12
Average value of each instrument	$450
Organ Manufactory	1
Men employed	2
Organs made	2
Bellows Manufactories	2
Men employed	5
Bellows made (mostly blacksmiths')	650
Steam Marble Saw Works	1
Men employed	30
Horse power of engine	15
Saws run (1 gang)	20
Breweries	17
Men employed	138
Beer made, barrels	76,602
Malt Manufactories	3
Men employed	8
Grain malted, barley, 100-lb. sacks	29,023
Hose and Belting Manufactories	3
Men employed	12
Hose made, feet	12,000
Hose and belting leather used, sides	2,750
Collar leather used, sides	3,000
Horse collars made, dozen	400
Match Manufactories	3
Men employed	14
Matches made, gross	25,000

Cutlers	2
Men employed	6
Value of manufactures	$4,800
Box Manufactories	5
Men employed	62
Lumber used (pine, fir and spruce), feet	4,000,000
Spanish cedar used, feet	110,000
Petroleum Refineries	2
Men employed	12
Number of stills run	6
Running oil made, gallons	57,429
Distillery capacity, crude oil per day, gallons	2,600
Glass Works	2
Men employed	80
Furnaces	2
Pots	13
Value of manufactures	$80,000
Capacity of works per month	$12,000
Glass-cutting Works	1
Men employed	2
Value of manufactures	$6,000
Mirror Silvering Works	1
Men employed	4
Silvering tables	3
Value of manufactures	$18,000
Billiard Table Manufactories	3
Men employed	12
Tables made	70
Average value of tables	$480
Soap Manufactories	10
Men employed	33
Soap made, pounds	2,831,419
Capacity of works per month, pounds	710,000
Brooms and Willow Ware Manufactories	3
Men employed	86
Brooms made, dozen	17,580
Pails, dozen	6,057
Tubs, nests of four each	7,654
Zinc washboards, dozen	3,582
Barrel covers, dozen	459
Peach baskets, dozen	412
Sieves, dozen	161
Powder kegs	60,000
Tanneries	5
Men employed	26

Tan bark used, cords	375
Hides tanned	2,400
Calf skins tanned, dozen	615
Kip skins tanned, dozen	515
Monthly capacity of works—	
Hides	650
Calf skins, dozen	300
Kip skins, dozen	300
Calf skins dressed and finished, dozen	1,200
CHEMICAL WORKS	2
Men employed	12
Nitrate of soda used, tons	250
Sulphur consumed, tons	200
Sulphuric and nitric acid made, tons	400
Capacity of works per day—	
Sulphuric acid, tons	2
Nitric acid, tons	1
Sulphate of copper made, tons	120
SUGAR REFINERIES	3
Men employed	259
Horse power of engines	225
Raw sugars used, pounds	22,743,312
Refined sugar made, barrels, 230 pounds each	87,630
Syrup made, gallons	570,031
Capacity of works per day, raw sugar, pounds	163,000

Many of the foregoing manufactories have not only a capacity to supply the wants of this State and the adjoining States and Territories, but also to admit of large exports. The flouring mills have a capacity of over half a million barrels per annum, and during the latter part of the year sent large quantities of flour via the Isthmus to New York. There the quality of the flour commanded the highest prices paid, while California wheat was condemned by Eastern millers as being too difficult to grind to make good flour.

Many of the iron foundries and boiler shops have capacity sufficient to make the largest castings required, while the largest sized boilers can be made of as good material and workmanship as can be found in the Atlantic States. Besides the domestic demand for machinery, etc., the shops and foundries have supplied a large demand from Mexico and other foreign countries. The inauguration of a line of first class steamers to Japan and China promises, when in full operation, to bring large orders to our workshops for machinery which has heretofore been supplied exclusively from Atlantic ports.

The glass works which have been established for the manufacture of white glass, during eighteen hundred and sixty-six, are capable of supplying the entire Pacific coast with all articles in that line.

Our soap works have almost entirely stopped the importation of all but fancy soaps, while the same results have been obtained by the manufacture of brooms and wooden ware, considerable quantities of the former having been exported to foreign ports.

The chemical works are of a capacity to supply the entire demand for acids for the refining of the precious metals, and the completion of the Golden City Chemical Works will still further increase this manufacture. These latter works are of most extensive capacity, and promise soon to engage in the manufacture of many chemicals, extracts, etc., which have hitherto been imported.

The sugar refineries have a capacity of more than double the requirements of the Pacific States and Territories; and if the importation of melado from the Hawaiian Islands at comparatively low prices is successful, they will in all probability become large exporters of refined sugars to other markets now supplied from Europe.

The lead and shot works and the cordage factory almost entirely supply the domestic demand.

The brass foundries supply about half the demand, while glue and neatsfoot oil are exported to the Atlantic States.

The hose and belting manufacture is largely increasing, and the articles made give entire satisfaction to parties using them. The domestic made matches have completely driven the imported article out of consumption.

Two small yet important manufactures have been inaugurated during the year, which promise to be of great benefit to our people. One is the manufacture of all kinds of saws from plate steel, and the other the sawing of marble by steam power. Hitherto all marble sawing was done by hand, and was an expensive and tedious process. In fact, the expense of labor was so great that it prevented the opening up of marble quarries in this State, as domestic sawed marble could not compete with that imported from Europe and the Atlantic States, where cheap labor and machinery were used. The present works are limited in capacity to the supplies of block mnrble to be had; but it is the intention of the owners to import and quarry largely all kinds of marble in the block, when the works will be made more extensive.

A most important manufacture was commenced in December, eighteen hundred and sixty-six; this was a type foundry, which, with three machines, employs seven men and thirty boys and girls, the value of the type made averaging at the rate of twenty thousand dollars per year. It is the intention of the proprietors to increase the number of machines to six, with proportionate addition of men and children required for the business. The quality of the type made is unexceptionable, and the demand is so large that orders for months ahead have been received.

Respectfully submitted,

WM. R. WHEATON,
Assessor.

SAN JOAQUIN COUNTY.

C. H. COVELL.....County Assessor.

OFFICE OF THE COUNTY ASSESSOR,
San Joaquin County, Stockton, November 4th, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: Inclosed you will please find my report for the year eighteen hundred and sixty-seven.

I have used all available means to make my figures as complete and correct as possible. There are many difficulties which hinder the collecting of statistics, the most prominent one being the fact that nearly all of those from whom they are to be collected regard them as matters of little or no consequence. More than one half of the taxpayers of this county come to the office to give in their lists of property, and they do so without having made any preparation whatever to enable them to give reliable answers with reference to much of the information sought. I believe, however, that the figures which I have made out are, so far as relates to the more important items, very nearly correct; and I think my report, as a whole, is much nearer to the actual facts than it was last year.

With reference to live stock, I think it would be well to give Assessors some instructions that would secure a uniformity of action throughout the State. This kind of property is continually changing from one county to another, as well as changing hands in the same county; therefore, unless some specified time is fixed upon, much of it may be returned by several parties for the same year.

I would have sent my report sooner, but my work is but just completed. This is a pretty large county, and according to the present method, it takes about all the time that the law allows to do the work.

Hoping that this will meet with your approval,

I am, most respectfully, your obedient servant,

C. H. COVELL,
County Assessor of San Joaquin.

SANTA BARBARA COUNTY.

AUGUSTIN TANSSENS..... .....County Assessor.

COUNTY ASSESSOR'S OFFICE,
Santa Barbara, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: I herewith present the annual report from this office.

There has been very little, if any, change in this county since last year. Operations which have been carried on for two years past, in gathering crude oil from the petroleum springs in this county, have been almost entirely suspended.

At Stott's refinery, on the Santa Paula Creek, work has been done all the year without much interruption. Most of the heavy work was confined to tunnelling, and during the latter part of September an explosion of rather a serious nature took place in the main tunnel, which will suspend work at the refinery for two or three months, to repair damages, as most of the crude material was obtained from that tunnel. The refinery has turned out an excellent article of oil, the most of which is shipped to San Francisco.

Works of an extensive nature are still carried on at Ojai, where the California Petroleum Company have their springs. No oil is being gathered there, however, the operations being confined exclusively to the building of roads through this fine property to facilitate transit—boring to a depth of six hundred feet having been already attained, with good prospects of final success.

The great oil fever which raged to such an extent in this county two years ago has entirely subsided, and interested parties are waiting for time to develop whether the springs are valuable or not.

The wheat crop was very small for the year, owing chiefly to the want of mills where the crop could be disposed of. For this reason all the flour consumed here comes from San Francisco. One or more mills in the county would pay handsomely on the investment; and an enterprising company who would put up a good mill in this town and another in San Buenaventura, thirty miles southeast of this, would realize good interest on the capital expended and at the same time would be doing an immense benefit to the county at large. I have been informed that it is proposed to put up at once a mill in San Buenaventura, to be ready for the crop of the coming season.

The bean crop gathered was a very meagre one, owing principally to its being nearly destroyed by field mice, which infested our fields this year in greater numbers than usual.

Very little barley was raised, most of the farmers cutting it for hay, which apparently is more remunerative than the grain.

The number of grape vines, almonds, olives and mulberry trees planted was far in excess of that of last year. A great number of other varieties of fruit trees have been set out, but growers appear to put more faith in the first four as to their paying qualities.

The stock of cattle is augmenting very slowly. The sheep have more than doubled since last year.

A project is on foot to open land communication with Tulare County, by building a road across the Coast Range from this town. The pro-

posed route has been examined by competent persons, who declare it perfectly feasible with a small outlay. It is proposed to ask for legislative aid at the next session, and whether granted or not the matter will be at once taken in hand. This route will open direct communication with the Clear Creek country, and the people of that region can obtain their supplies by water from San Francisco to this port, and thence by land across the mountains, which will be a saving to them of many miles of land carriage.

A cheese dairy has lately been established about six miles from this town, on the property of our enterprising townsman, Dr. J. B. Shaw, and is under the charge of Mr. Smithering.

Respectfully,

AUGUSTIN TANSSENS,
County Assessor.

SANTA CLARA COUNTY.

W. O. BARKER.....County Assessor.

ASSESSOR'S OFFICE, SANTA CLARA COUNTY,
San José, September 10th, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: In compliance with law, I beg leave to submit the following report:

You will see by the report that the general resources of the county are much the same as reported last year. There is quite an increase in the amount of wheat raised, owing in part to the low price of other kinds of small grain, and to the fact that the farmers find the soil better adapted to wheat growing than other grains, although all kinds yield abundantly. I think I can safely say that Santa Clara County is not surpassed by any county in the quality and quantity of its grain yield.

The cultivation of the grape is still engaging the attention of many, and although the late frosts damaged the vines last year yet the amount of wine manufactured was much larger than any year prior. The quality of the wine is superior, and finds ready sale. We have vineyards containing from one hundred to two hundred acres.

A silk factory is in course of erection in this city, which, when completed, will be an improvement of a substantial nature and an ornament to our county. Our enterprising townsman, L. Prevost, is engaged in raising silkworms with good success. He has now a large family of worms which are producing silk cocoons successfully. Mr. Prevost thinks from the experience he has had in silk raising, that the climate of California is very well adapted to that enterprise.

The mining interest of this county is still confined to quicksilver. A new mine of cinnabar has recently been discovered, which prospects very rich. It is located on the ranch of Mr. Chapman, about three miles from this city, who is the lucky owner of it.

Land titles are becoming quieted, which stimulates the occupants of the land to build permanent improvements, and invites rich men to make homes in our fertile valley.

The accompanying schedule shows the various agricultural products of the county, as well as the various trees and vines; also, live stock.

All of which is respectfully submitted.

W. O. BARKER,
Assessor of Santa Clara County.

SANTA CRUZ COUNTY.

N. TAYLOR.....County Assessor.

SANTA CRUZ, September 23d, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: In compliance with the duties of my office, I herewith transmit to you my annual report of the statistics of Santa Cruz County. I have endeavored to arrive at correctness as near as possible. The inclosed tabular sheet will exhibit the various products of this county, which do not vary much from my last year's report. The valuation of property is more than last year, principally in the enhanced value of real estate.

Of items not reported in the blank, there was manufactured some eighty thousand kegs of powder, two hundred and sixty-eight thousand six hundred and fifty-six pounds of printing and twenty-four thousand eight hundred fifty reams of wrapping paper.

The estimated value of leather made is some one hundred and seventy-five thousand dollars.

There are two whaling companies in this county. One company made some forty-five barrels of oil; from the other I could get no information.

The dairymen are going ahead, as you see by the increased amount of butter and cheese.

Every department of industry is being vigorously prosecuted, and the resources of the county are being developed. Every year roads and bridges are being built by individuals and the county; railroads are contemplated, which, no doubt, will be made in due time.

Respectfully, etc.,

N. TAYLOR,
Assessor of Santa Cruz County.

SIERRA COUNTY.

JOHN CORBETT.....County Assessor.

DOWNIEVILLLE, SIERRA COUNTY,
August 26th, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: Herewith I send you my report as Assessor of Sierra County, for the year eighteen hundred and sixty-six.

The footings are as complete as they can under the condition of things in this, and, I may say, in all the mountain counties, be made.

The land under cultivation in many localities can only be guessed at, as much of it has not been surveyed; and in arriving at the number of acres I have been compelled to resort to an estimate, but in every instance it will be found to be very near the exact thing.

You will perhaps notice that for a large and populous county, we return but a small number of horses, mules and cows. This is attributable to the fact that in the Winter the greater portion of our stock are sent to the valley counties to be wintered, and as a general thing are not brought back again until the Assessor's report is in great part made up; and it is very rarely the case that they are allowed to return into our county until they are made to figure in the report of Assessors of other counties, nor until the owners have been made to pay taxes on them in counties where they have been placed only temporarily.

This manner of taxation operates very disadvantageously to Sierra County, and if such things can by any fair and honorable means be avoided, we desire to see a change.

The greater portion of the farming land in Sierra County lies on the east side of the Sierra Nevada Mountains, in what is known as Sierra and Long Valleys. Sierra Valley is some twenty miles in length, and ranges from three to eight miles wide, through the entire length of which the waters of Feather River flow by an easy and sluggish movement, finding a passage through the Sierra Nevada Mountains by a chain of valleys which would appear to an observer as though intended by nature as a route for the Atlantic and Pacific Railroad, because from actual observations I am enabled to say that at no time during the past Winter did the snow along the line of said stream exceed two feet in depth, and at no time during ten years last past has communication been cut off or travel in any degree impeded. I mention this with a view to call attention to the fact that in California has been the first instance where a railroad engineer has left a stream which breaks entirely through a chain of mountains, and route entirely feasible at all seasons of the year, in order to pass over the top of the mountrins through a region of almost perpetual snow.

The grain crop of Sierra County is principally produced in Sierra Valley; also, the greater portion of the butter and cheese is made there. More than one half of the more valuable lands in this valley are properly speaking swamp and overflowed lands, and as such, the property of the State of California; but I am informed that notwithstanding this patent fact, surveyors acting under the direction of some one of the United States Land Offices, have entered upon, surveyed and returned a plot of these lands to the General Land Office, and unless the attention of the

Legislature is called to this fact, they will soon be placed in the market as Government lands, the State thereby losing a revenue to which she is beyond question clearly entitled by Act of Congress.

The fruit-growing is chiefly confined to the Yuba River and its tributaries, and a large portion of the entire crop is of the finest quality. Nearly all other agricultural products reported in the accompanying table (hay excepted) are grown along the small creeks and ravines west of the summit.

All of which I most respectfully submit for your consideration, and hope that it will meet with your approval.

JOHN CORBETT,
Assessor of Sierra County.

STANISLAUS COUNTY.

E. D. Giddings.....County Assessor.

Knight's Ferry, August 4th, 1867.

Hon. J. F. Houghton,
Surveyor-General:

Sir: I herewith transmit to you the statistical report of the agricultural products of this county, as required by law. The report is as full and as carefully compiled as circumstances will permit; but, notwithstanding my efforts, I cannot claim for it to be a perfect exhibit of the resources of the county. Very few farmers keep an account of the amount of the crops raised by them, and in many cases, when questioned by the Assessor in regard to their last year's crops, for want of memoranda to refer to, will underestimate the amount; in numerous other instances, I do not find the parties at home on my rounds in making the assessments, and when they return their assessments to me by mail they rarely, if ever, furnish any statistical information, for these and kindred reasons. The report is necessarily below the truth; but, notwithstanding, I think the showing made speaks well for the prosperity of our county, and, as you will perceive from the comparison of the number of acres under cultivation in eighteen hundred and sixty-six with those under cultivation the present year, the agricultural interest is being developed very rapidly. As an instance of this, Paradise Valley—the name given by the settlers to a portion of the San Joaquin Valley between the Stanislaus and Tuolumne Rivers, which only about five years since was regarded as almost a desert and unfit for agriculture—has produced this year at least four thousand tons of wheat, the average yield being about fifteen bushels per acre; and this would have been increased to a considerable extent had it not been for the heavy winds which swept over the county about the time the early and best grain was ripening, and in some instances threshed out nearly one half the crops; and there are thousands of acres of just such lands lying within from five to twenty miles of points accessible to steamboats on the San Joaquin and Tuolumne Rivers for six or eight months in the year.

The financial condition of the county is also very satisfactory, with a debt of only about twenty-five thousand dollars, and decreasing; State and county taxes at two dollars and eighty-seven cents per hundred dollars, and an assessment roll of upwards of one million two hundred thousand dollars, increasing at the rate of one hundred to two hundred thousand dollars per annum during the last three years. The citizens of this county have abundant reason to be thankful to Providence for the bountiful favors conferred upon them.

Your obedient servant,

E. D. GIDDINGS,
County Assessor of Stanislaus County.

SISKIYOU COUNTY.

SAMUEL MAGOFFY.....County Assessor.

YREKA, October 7th, 1867.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: In compliance with your request and with the law, I have the honor to submit my report for the current year.

I have endeavored to comply as strictly as possible to the requirements, but it has been impossible to make everything as complete as it should be, as the county is very large, and portions of it can only be visited but once, for lack of time.

It will be seen that the county has prospered in some branches of industry, while in others it has retrograded a little. Our population remains about the same as it has been the last three years, and the class of which it is composed has more of the permanent element in it than heretofore. The agricultural interests of the county are constantly improving, while the mines are falling off; not that they are giving out, but from the lack of capital to carry them on and develop them in the manner they are in the more favored counties, which are nearer the great centres of supply and of easy access. We need but railroads and capital to make Siskiyou thriving, prosperous and populous.

Stock of all kinds is scarce from the constant drain of the past three years for supplying the northern mines.

Our quartz mills lie idle for the lack of the right kind of enterprise.

Our flouring and lumber mills have constant employment, and our people are making their homes permanent.

Respectfully yours,

SAMUEL MAGOFFY,
County Assessor of Siskiyou County.

TUOLUMNE COUNTY.

THOMAS C. BIRNEY.....County Assessor.

Hon. J. F. HOUGHTON,
Surveyor-General:

SIR: I have the honor herewith to transmit to you the tabular statement required by the Act of the Legislature, approved March tenth, eighteen hundred and sixty-six. It embraces information required to be reported for the year terminating December thirty-first, eighteen hundred and sixty-six, with three exceptional items relating to the year eighteen hundred and sixty-seven.

The Act requires of the Assessors "a full and true statement of all the agricultural and industrial pursuits and products of the several counties, districts and townships for the preceding year, and such other information as they may be required by the Surveyor-General to collect, and to report the same to the office of the Surveyor-General between the first day of September and the first day of November of each year."

The tabular statement, without a report explaining the same, would be devoid of that interest which such a document is entitled to, when embodying those facts that afford information and require explanatory remarks to illustrate the character and importance of the several products and industries to which it relates.

While the mines of our placer diggings are still wrought with measurable success, and our gold bearing quartz veins are now being successfully prospected, the agricultural interest is becoming one of increasing importance, as the placer diggings diminish in the amount of their products.

The culture of the grape, the manufacture of wine, and the products of the various fruits of our gardens and ranches are all becoming sources of increasing wealth. The foothills of our mountains are peculiarly well adapted to the culture of the grape, and the richest and most choice varieties flourish here in such superior quality and abundance as shows that no portion of the globe can claim to have a more favorable soil and climate for the growth of the grape or the manufacture of the rich and superior wines. Other fruit in our gardens and ranches flourish luxuriantly in the mountain districts, and it only requires time, capital and knowledge of wine manufacture, to make the wine interest a most profitable one for the investment of capital; while other interests of gardening and ranch cultivation of fruits will be highly remunerative to the agricultural farmer who shall make himself a permanent resident of the mountain districts—a region superior to all others in health, beauty and enjoyment of its grand and beautiful scenery and invigorating atmosphere. California is everywhere an inviting region to the traveller, but to him the mountain gardens and ranches are a paradise of pleasure.

The fruits other than the grape—the apple the pear, the plum, the peach, the nectarine, the apricot—all find a soil fitted to their best and richest growth and highest excellence. The quince, the cherry, the fig, the olive, the prune, the almond and mulberry all flourish in abundance with opportune cultivation, and can be produced with ease and of excellent quality.

The several domesticated berries are cultivated with uniform success.

The strawberry, raspberry, gooseberry, blackberry and other berries furnish fine specimens of superior quality and in great abundance.

Grain and vegetables in favorable seasons are of fine growth and excellent quality, but the dry seasons compel the ranchman to cut his fields of wheat, barley and oats for a hay crop; while in other seasons more favorable the crops of wheat, barley and oats are of sterling quality and of good average yield. The last season the hay crop was large and prices reduced. Indian corn does not find a genial climate in the mountains. The seasons are too short and the chilly air predominates in the earlier and later portions of the necessary time to produce it in its better growth.

The mountains are a favorite region for bees and their manufacture of honey.

Poultry flourishes in the mountains, and eggs and chickens are abundant; butter is of superior quality, and is made in considerable quantities. But little attention is paid to the making of cheese in this district.

The finest specimen of potatoes to be found in California are cultivated in the mountains. On one ranch, eight acres produced fifty tons the last season. In fruits and vegetables, all the crops were, last season, a success—especially the grape, the plum, and the pear.

Beets, turnips, carrots, and cabbages, are a sure vegetable crop, and of good quality. Pumpkins, squashes, melons, tomatoes, cucumbers, and other garden vegetables, are abundant.

One firm in this district slaughtered two thousand beeves, three hundred hogs, and three thousand sheep, last season.

Horses, mules and asses, coming from every part of the States, are of every variety, and but few are bred in this district.

It may not be amiss to notice the marble quarries in this district. Our quarries produce some of the finest specimens of marble, both for common use and for fancy purposes. Four quarries have been already discovered in this district, and all of excellent quality:

First—Near the Stanislaus River, of pure white marble; excellent and well suited for statuary, receiving a high polish.

Second—In Matelot Gulch; pink and black mixed; takes a high polish.

Third—Knapp's Ranch; white marble, with blue veins.

Fourth—Vine Springs; the ledge is immense, of good quality, and suitable for almost any purpose. It has been opened and wrought extensively for several years.

Perhaps no country equals California in the development of fossil remains of ancient date, of the elephant, the rhinoceros, the mammoth, and mastodon, and numerous other animals; and the bones and skulls of the ancient inhabitants who once peopled this country, but thousands of ages since have passed away. These remains have been, within the past few years, and are now being exhumed, in the mining districts, with their cotemporaries of the animal tribe, by the miner in his search for golden treasure; and science is being enriched by the development of geological history, as well as the miner by the harvest of his labors. Thus, while the miner is gaining his treasure, the truth of science is confirmed and its history enlarged.

District Number Two has furnished a great number of valuable fossils, which have enriched the cabinets of the learned and scientific as

well as furnished those who are fond of accumulating specimens of natural history.

With these limited remarks, I submit this report to the consideration of the efficient agent of the Government to whom it is my duty to transmit it.

With sentiments of high consideration and respect,

THOS. C. BIRNEY,
Assessor, Tuolumne County.

APPENDIX.

FIFTEENTH ANNUAL FAIR

OF THE

CALIFORNIA

State Agricultural Society,

TO COMMENCE

On the 15th and end on the 25th September, 1868,

AT THE

CITY OF SACRAMENTO.

OVER $10,000

APPROPRIATED FOR PREMIUMS.

Liberal Special Premiums for all Worthy Articles exhibited not mentioned in the Schedule.

ALSO, IN ADDITION TO THE PREMIUMS NAMED, THE SOCIETY WILL GIVE A

GOLD MEDAL

To the most Meritorious Exhibition in each of the seven Departments.

STATE BOARD OF AGRICULTURE FOR 1868.

PRESIDENT.

CHARLES F. REED ..... Grafton, Yolo County.

DIRECTORS.

C. T. WHEELER ..... Sacramento.
JOHN H. CARROLL ..... Sacramento.
EDGAR MILLS ..... Sacramento.
B. R. CROCKER ..... Sacramento.
T. L. CHAMBERLAIN ..... Placer.
WM. P. COLEMAN ..... Sacramento.
H. M. LARUE ..... Sacramento.
H. R. COVEY ..... San Francisco.
R. S. CAREY ..... Yolo.

OFFICERS OF THE BOARD.

Secretary ..... I. N. HOAG, Yolo; P. O., Sacramento.
Treasurer ..... R. T. BROWN, Sacramento.
Chemist and Metallurgist ..... Dr. R. OXLAND, F. C. S., San Francisco.
Geologist ..... Prof. WM. P. BLAKE, San Francisco.
Meteorologist ..... T. M. LOGAN, M. D., San Francisco.
Zoologist and Entomologist ..... H. W. HARKNESS, M. D., Sacramento.
Botanists ..... A. KELLOGG, M. D., San Francisco; Prof. H. N. BOLANDER, San Francisco.

$100,000 IN PREMIUMS

OFFERED BY THE STATE

"For the Encouragement of Agriculture and Manufactures."

Articles to be exhibited and premiums awarded at the State Fair, by the

STATE BOARD OF JUDGES:

F. F. LOW.....SACRAMENTO.
CHARLES F. REED.....YOLO.
SAMUEL FISHER.....SAN JOAQUIN.
G. N. SWEEZY.....YUBA.
H. J. BOOTH.....SAN FRANCISCO.

CLASSIFICATION.

FIRST DEPARTMENT.....LIVE STOCK.
SECOND DEPARTMENT.....MACHINERY, IMPLEMENTS, ETC.
THIRD DEPARTMENT.....TEXTILE FABRICS—MILL AND DOMESTIC PRODUCTS.
FOURTH DEPARTMENT.....MECHANICAL PRODUCTS.
FIFTH DEPARTMENT.....AGRICULTURAL PRODUCTS.
SIXTH DEPARTMENT.....HORTICULTURAL PRODUCTS.
SEVENTH DEPARTMENT.....FINE ARTS, ETC.

NOTICE TO EXHIBITORS AND MEMBERS.

The Steam Navigation Company, the Central Pacific Railroad, the Sacramento Valley Railroad and the California Central Railroad will transport all articles and animals exhibited at the Fair, over their respective routes, free of charge. Freight being paid on them to the Fair will be returned upon reshipment by the same owner and exhibition of certificate of Secretary that the same have been exhibited. The same companies will issue excursion tickets to all parties going to the Fair and returning, at about half price.

LIST OF PREMIUMS

OPEN TO ALL THE STATES AND TERRITORIES.

FIRST DEPARTMENT.

LIVE STOCK.

HORSES.

In this department the same animal cannot be entered more than once, except in sweepstakes, or as a colt with its sire or dam, as a member of a family.

No animal will be allowed to compete for a premium unless free from disease or blemish which can be transmitted to posterity.

CLASS I—THOROUGHBRED HORSES.

In this class none will be permitted to compete but such as furnish a complete pedigree—tracing the entire line of descent to the English parent, on the side of both sire and dam. The standard of authority for the pedigree of thoroughbred horses will be the English and American Stud Books.

Animal.	Premium.
Stallions.	
Best four years old and over	$50 00
Best three years old	40 00
Best two years old	30 00
Best one year old	20 00
Best colt under one year	15 00
Mares.	
Best four years old and over, with colt	50 00
Best four years old and over	40 00
Best three years old	30 00
Best two years old	25 00
Best one year old	20 00
Best mare colt under one year	15 00
Families.	
Best thoroughbred sire, with not less than ten of his colts, all thoroughbred	75 00
Best thoroughbred dam, with not less than four of her colts, all thoroughbred	50 00
Best stallion, other than thoroughbred, with not less than ten of his colts, open to all	75 00
Best dam, other than thoroughbred, with not less than three of her colts	40 00

CLASS II—HORSES OF ALL WORK.

Animal.	Premium.
Stallions.	
Best four years old or over	$40 00
Best three years old	30 00
Best two years old	20 00
Best one year old	15 00
Mares.	
Best four years old and over, with colt	40 00
Best four years old and over	30 00
Best three years old	20 00
Best two years old	15 00
Best one year old	10 00

CLASS III—GRADED HORSES.

In this department none will be allowed to compete but such as furnish satisfactory proof of a cross of either sire or dam with thoroughbreds.

Animal.	Premium.
Stallions.	
Best four years old and over	$40 00
Best three years old	30 00
Best two years old	20 00
Best one year old	15 00
Best colt under one year, without reference to sex	15 00
Mares.	
Best four years old and over	30 00
Best four years old and over, with colt	40 00
Best three years old	20 00
Best two years old	15 00
Best one year old	10 00

CLASS IV—DRAFT HORSES.

Stallions.	
Best four years old and over	30 00
Best three years old	20 00
Best two years old	15 00
Best one year old	10 00
Mares.	
Best four years old and over, with colt	30 00
Best four years old and over	25 00
Best three years old	20 00
Best two years old	15 00
Best one year old	10 00

CLASS V—ROADSTERS.

All animals competing for a premium in this department must be exhibited in harness.

Animal.	Premium.
Stallions.	
Best four years old and over	$40 00
Best three years old	30 00
Best two years old	20 00
Best gelding four years old and over	30 00
Mares.	
Best four years old and over	30 00
Best three years old	20 00
Best two years old	15 00

CLASS VI—CARRIAGE HORSES.

Best matched span carriage horses, owned and used as such by one person	40 00

CLASS VII—ROADSTER TEAMS.

Best double team roadsters, owned and used as such by one person	40 00

CLASS VIII—SADDLE HORSES.

Best saddle horse	15 00

CLASS IX—COLTS.

Free to all except those entered as thoroughbred and graded.

Best yearling horse colt	30 00
Best sucking horse colt	20 00
Best yearling mare colt	20 00
Best sucking mare colt	15 00
Best exhibit of not less than six colts, owned by one person, of any age or sex, can be entered in other classes when allowed by the general rules	50 00

CLASS X—SWEEPSTAKES.

Open to all. In the awards in this department blood will have the preference only when in the examination all other qualifications shall be found equal.

Best stallion of any age	$100 00
Best mare of any age	75 00

An entrance fee of five per cent. will be required on making the entry in this class.

CLASS XI—JACKS AND MULES.

Animal.	Premium.
Best jack	$50 00
Best jennet	40 00
Best pair of mules	40 00
Best single mule three years old and over	30 00
Best mule two years old	20 00
Best mule one year old	10 00

CATTLE.

CLASS I—DURHAM CATTLE.

Bulls.	
Best four years old and over	$40 00
Best three years old and over	25 00
Best two years old and over	20 00
Best one year old and over	15 00
Best bull calf	10 00
Cows.	
Best four years old and over	30 00
Best three years old and over	25 00
Best two years old and over	20 00
Best one year old and over	15 00
Best heifer calf	10 00
Devons, Herefords, Alderneys and Ayrshires.	
Same premiums as for Durhams.	

CLASS II—GRADED CATTLE.

Bulls.	
Four years old and over	30 00
Three years old and over	25 00
Two years old and over	20 00
One year old and over	15 00
Bull calf	10 00
Cows.	
Best four years old and over	30 00
Best three years old and over	20 00
Best two years old and over	15 00
Best one year old	10 00

CLASS III—SWEEPSTAKES.

Best bull of any age or stock	50 00
Best cow of any age or stock	40 00

SHEEP AND GOATS.

CLASS I—FAT SHEEP.

Animal.	Premium.
Best three, two years old and over	$10 00
Best three, under two years	10 00

CLASS II—STOCK SHEEP AND MUTTON.

Best ram two years old and over	10 00
Best ram under two years	8 00
Best three ewes two years old and over	10 00
Best three ewes under two years	10 00

CLASS III—FINE WOOL SHEEP.

Spanish Merino.	
Best ram two years old and over	20 00
Best ram under two years	15 00
Best three ram lambs	15 00
Best three ewes two years and over	15 00
Best three ewes under two years	15 00
Best five ewe lambs	15 00
French Merino.	
Same premiums as for Spanish.	

CLASS IV—GRADE OR CROSS WITH SPANISH MERINO.

In this class a statement must be filed with the Committee of the degree of the cross and the breed of the sheep crossed with.

Animal.	Premium.
Best ram two years old and over	$15 00
Best ram under two years	10 00
Best three ram lambs	15 00
Best three ewes two years and over	10 00
Best three ewes under two years	10 00
Best five ewe lambs	10 00
Grade or Cross with French Merino.	
Same premiums as for Spanish.	

CLASS V—SWEEPSTAKES ON SHEEP.

Best buck of any age or breed	25 00
Best ewe of any age or breed	20 00
Best pen of not less than five ewes of any age or breed	25 00

CLASS VI—CASHMERE GOATS.

Animal.	Premium.
Best thoroughbred buck	$20 00
Best thoroughbred she goat	15 00
Best thoroughbred three kids	15 00
Graded.	
Best lot of three	15 00

CLASS VII—WOOL.

For the heaviest and best fleece of cleansed wool:	
Best fleece of buck	20 00
Best fleece of ewe	20 00

SWINE.

CLASS I—LARGE BREEDS, WHICH, WHEN FAT, WILL WEIGH AT MATURE AGE OVER 300 POUNDS.

Best boar two years old and over	15 00
Best boar under two years	10 00
Best boar six months old and less than one year	10 00
Best breeding sow two years and over	10 00
Best breeding sow one year old	10 00
Best sow six months old and under one year	10 00
Best lot of not less than six pigs, not less than five nor more than ten months old	20 00

CLASS II—SMALL BREEDS, WHICH, WHEN FAT AT MATURE AGE, WILL NOT WEIGH OVER 300 POUNDS.

Same premiums as for large.

POULTRY.

CLASS I.

Fowl.	Premium.
Best lot of white or gray Dorkings	$5 00
Best lot of black Spanish	5 00
Best lot of black Poland	5 00
Best lot of Jersey Blues	5 00
Best lot of Sumatra game	5 00
Best lot of English game	6 00
Best lot of any other distinct variety	5 00
Best lot of turkeys	5 00
Best lot of ducks, any good variety	5 00
Best lot of geese	5 00
Best lot of Guinea fowls	5 00

SECOND DEPARTMENT.

MACHINERY, IMPLEMENTS, ETC.

Models in Classes I, II, III and IV cannot compete with full-sized machines.

All machinery, as far as practicable, to be exhibited in motion.

All articles named in Classes I, II, III, IV, V, VI and VII of this Department, if of California manufacture, will receive the premium offered and diploma; if not, they will be awarded a diploma only.

CLASS I—MACHINERY, ENGINES, ETC.

Article.	Premium.
Best display of general machinery from one shop	Diploma.
Best light portable prospecting mill for reducing quartz	$25 00
Best machine for saving quartz sulphurets	25 00
Best concentrator for copper ores	25 00
Best grinding and amalgamating pan, combined	25 00
Best turbine wheel (California manufacture)	25 00
Best quartz crusher (California manufacture)	25 00
Best portable steam engine (California manufacture)	25 00
Best portable steam engine (Eastern manufacture)	Diploma.
Best steam gauge	3 00
Best preventive of steam boiler explosion	5 00
Best portable sawmill	20 00
Best saw gummer	2 00
Best self-setting sawmill head block	5 00
Best stave machine	5 00
Best shingle machine	5 00
Best lath machine	5 00
Best hoop machine	5 00
Best moulding machine	5 00
Best mortising machine	5 00
Best sash machine	5 00
Best tenoning machine	5 00
Best scroll sawing machine	5 00
Best wood turning lathe	5 00
Best iron turning lathe	5 00
Best iron planing machine	10 00
Best wood planing machine	10 00
Best water wheel	10 00

CLASS II—AGRICULTURAL MACHINES (FIRST DIVISION).

Article.	Premium.
Best display of agricultural machinery by any one house (California manufacture)	$25 00
Best threshing machine	Fr. diploma.
Best sweep, horse power (California manufacture)	10 00
Best endless chain, horse power (California manufacture)	10 00
Best threshing machine, operated by endless chain power	5 00
Best circular sawmill, operated by horse power	5 00
Best log crosscut sawmill, horse power	10 00
Best hand power crosscut sawmill	5 00
Best clover huller and cleaner	5 00
Best clover huller	5 00
Best hemp and flax dressing machine	5 00
Best cider mill and press	10 00
Best dog power churn	3 00
Best horse hay rake	5 00
Best hay and straw cutter	5 00
Best hay press	10 00
Best power corn sheller	5 00
Best hand corn sheller	5 00

If possible the Board will manage to have a grand trial of reaping and threshing machines, to come off during the Fair, and will give special premiums for the same.

CLASS III—AGRICULTURAL MACHINES (SECOND DIVISION).

Article.	Premium.
Best wheat drill (two horse)	$10 00
Best wheat drill (one horse)	5 00
Best grain broadcast sowing machine	10 00
Best machine for cutting and shocking corn	5 00
Best clover seed harvester	5 00
Best self-raking and reaping machine	10 00
Best reaping machine	10 00
Best mowing machine	10 00
Best combined reaper and mower	10 00
Best display of reaping and mowing machine knives	5 00
Best grain binder	5 00
Best hay pitching machine	3 00
Best corn planter (horse power)	5 00
Best corn planter (hand)	2 00
Best potato planter	5 00
Best potato digger	5 00
Best field roller and crusher	5 00
Best harrow	3 00
Best one-horse corn cultivator	2 00
Best two-horse corn cultivator	5 00
Best horse hoe	2 00
Best double shovel plough	2 00

CLASS IV—AGRICULTURAL MACHINES (THIRD DIVISION).

Article.	Premium.
Best smut machine	$10 00
Best farm feed mill	5 00
Best fanning mill	5 00
Best flour packing machine	3 00
Best self-regulating windmill	5 00
Best stock scales for general purposes, to be set up by exhibitor, and be used by the Board during the Fair, free of charge	15 00
Best platform scales	5 00
Best stump extractor	10 00
Best brick machine	10 00
Best drain tile machine	10 00
Best farm gate	3 00
Best beehive (without bees)	3 00
Best refrigerator	2 00
Best agricultural boiler	3 00
Best portable fence	3 00
Best ornamental fence	5 00
Best economical fence for tule land	10 00

CLASS V—TOOLS AND HOUSEHOLD IMPLEMENTS.

Best display of haying and harvesting tools	$20 00
Best set of draining tools	5 00
Best farm road scraper	2 00
Best garden seed drill	2 00
Best cheese press	3 00
Best cheese vat, with heater attached	5 00
Best cheese shelf model	3 00
Best churn	2 00
Best butter worker	1 00
Best cabbage cutter	2 00
Best sausage meat cutter and stuffer	1 00
Best washing machine	3 00
Best clothes wringer	2 00
Best mangle or ironing machine	2 00
Best clothes horse to occupy the least space	2 00
Best half dozen washboards	1 00
Best well pump	3 00
Best apparatus for raising water for irrigating purposes	10 00
Best apparatus for raising water for mining purposes	10 00

CLASS VI—PLOUGHS.

Best steam plough, to be tested to the satisfaction of the Committee, and its utility fully demonstrated	$50 00
Best two-gang plough	15 00
Best three-gang plough	20 00
Best plough for general purposes	10 00
Best stubble plough	10 00
Best sod plough	10 00
Best steel plough	10 00
Best cast iron plough	10 00
Best subsoil plough	5 00
Best sidehill plough	5 00
Best one-horse plough	3 00

Article.	Premium.
Best mole or blind ditching plough	10 00
Best open ditching plough	10 00
Best dynamometer	3 00
Best display and greatest variety of ploughs	10 00

The Board will furnish to exhibitors suitable grounds for practically testing their ploughs, under the direction of the Awarding Committee.

CLASS VII—VEHICLES.

Article.	Premium.
Best two-horse family carriage	$25 00
Best one-horse family carriage	20 00
Best top buggy	15 00
Best trotting wagon	10 00
Best farm wagon for general purposes	10 00
Best spring market wagon	10 00
Best cart	5 00
Best street goods wagon	5 00
Best wagon or carriage break	2 00
Best jackscrew	1 00
Best carriage or cab for children	5 00
Best display of carriage wheels, hubs, etc	5 00

THIRD DEPARTMENT.

TEXTILE FABRICS—MILL AND DOMESTIC PRODUCTS.

TEXTILE FABRICS AND MATERIALS OF WHICH THEY ARE MADE.

Articles to be exhibited by manufacturer, and articles which heretofore have received a premium to be excluded from competition, except in Class VI.

CLASS I—FABRICS MADE FROM CALIFORNIA SILK.

Article.	Premium.
Best specimen of silk manufactured, not less than five yards	$20 00
Best pound reeled silk, made in family	10 00
Best pound sewing silk, made in family	10 00
Best specimen of raw silk goods	10 00
Best pair of silk stockings	10 00
Best pair of silk gloves	10 00
Best silk shawl	20 00
Best silk cravat	10 00
Best piece of pocket handkerchiefs	10 00

CLASS II—MILL FABRICS.

Best display of woollen goods by one manufactory	$50 00
Best display of cotton goods by one manufactory	50 00
Best ten yards woollen cloth	5 00
Best ten yards cassimere	5 00
Best ten yards satinet	5 00
Best ten yards jean	5 00
Best ten yards floor oil cloth	3 00
Best ten yards tweed	5 00
Best ten yards cloth of flax cotton	5 00
Best piece cotton sheeting	3 00
Best ten yards of flannel	5 00
Best fifteen yards woollen carpet	5 00
Best fifteen yards tow cloth	3 00
Best ten yards linen	5 00

Article.	Premium.
Best ten yards linen diaper	3 00
Best ten yards kersey	3 00
Best hearth rug	3 00
Best double carpet coverlet	5 00
Best pair cotton wove stockings	1 00
Best pair linen wove stockings	1 00
Best pound linen sewing thread	1 00
Best shawl	3 00
Best Mackinac blanket	3 00
Best pair woollen blankets	5 00
Best stocking yarn	3 00
Best oil cloth table cover	1 00
Best display of cordage	5 00

CLASS III—NEEDLE, SHELL AND WAX WORK; CLOTHING, HATS, CAPS, FURS, ETC.

Best exhibit and greatest number of articles in this class	Fr. diploma.
Best ottoman cover	$3 00
Best table cover	2 00
Best fancy chair work with needle	3 00
Best fancy chair cushion and back	3 00
Best woollen shawl	3 00
Best crochet shawl	2 00
Best worked shawl	3 00
Best lace cape	3 00
Best lamp stand mat	2 00
Best ornamental needle work	3 00
Best silk embroidery	3 00
Best embroidered sofa cushion	2 00
Best embroidered mantilla	3 00
Best embroidered table spread	2 00
Best embroidered dressing gown	3 00
Best embroidered lady's robe	3 00
Best embroidered lady's dress	3 00
Best embroidered children's clothes	3 00
Best embroidered undersleeves	2 00
Best embroidered lady's collar	2 00
Best embroidered handkerchief	2 00
Best chenille embroidery	3 00
Best embroidery with beads	3 00
Best tatting collar	3 00
Best worked collar	2 00
Best worked vail	3 00
Best worked handkerchief	2 00
Best silk bonnet	3 00
Best velvet bonnet	3 00
Best knit cloak	3 00
Best exhibit of men's clothing	3 00
Best exhibit of boys' clothing	3 00
Best exhibit of men's hats and caps	3 00
Best collection of furs	3 00
Best assortment leather gloves and mittens	3 00
Best variety of linen embroidery	3 00
Best group of artificial flowers	3 00
Best variety of artificial flowers	3 00
Best specimen of wax flowers	2 00
Best group of wax flowers	3 00
Best specimen of wax fruit	2 00
Best and largest variety of wax fruit	3 00
Best specimen of moss or lichen work	3 00
Best specimen cone work	3 00
Best specimen leaf work	3 00
Best specimen flower work	3 00
Best specimen shell work	3 00

Article.	Premium.
Best braid of straw or grass	3 00
Best specimen of braid work	2 00
Best embroidered picture	3 00
Best white quilt	3 00
Best worked quilt	3 00
Best silk quilt	3 00
Best patchwork quilt	3 00
Best children's affghan	2 00

CLASS IV—HOUSEHOLD FABRICS.

No articles manufactured in factories or out of the family will be received in this class. Exhibitors must accompany their articles with a certificate of manufacture in the family within the year.

Article.	Premium.
Best ten yards jean	$5 00
Best pair woollen blankets	5 00
Best ten yards flannel	5 00
Best woollen carpet, fifteen yards	5 00
Best ten yards linen	5 00
Best ten yards linen diaper	5 00
Best ten yards kersey	5 00
Best pair kersey blankets	5 00
Best rag carpet, fifteen yards	5 00
Best fifteen yards tow cloth	5 00
Best hearth rug	5 00
Best double carpet coverlet	5 00
Best pair woollen knit stockings	2 00
Best pair of cotton knit stockings	2 00
Best pair by misses under twelve years of age	2 00
Best pound of linen sewing thread	2 00
Best pair of woollen fringe mittens	2 00
Best pair of woollen mittens	2 00
Best pair by misses under twelve years of age	2 00
Best pair of woollen stockings by misses under twelve years of age	2 00
Best linen handkerchiefs	2 00
Best netting	2 00
Best worsted knit stockings	2 00
Best stocking yarn	2 00
Best woollen shawl	2 00
Best mill bag	2 00
Best woollen knit drawers	2 00
Best woollen knit shirt	2 00
Best foot mats	2 00
Best straw hat	3 00
Best palm leaf hat	3 00
Best straw bonnet	3 00
Best palm leaf bonnet	3 00
Best grass bonnet	3 00
Best grass hat	3 00
Best gentlemen's shirts	2 00
Best knit bedspread	2 00
Best wove bedspread	2 00
Best ten pounds dressed flax	5 00
Best five pounds flax cotton	10 00
Best five pounds flax yarn	5 00

CLASS V—SADDLERS' AND SHOEMAKERS' WARE AND MISCELLANEOUS ARTICLES.

Article.	Premium.
Best travelling trunk	$5 00
Best carpet sack	2 00
Best set of carriage harness	5 00
Best set of farm harness	5 00
Best display of leather	5 00
Best display of saddles and bridles	5 00
Best display of hames	3 00
Best display of saddletrees	3 00
Best display of brushes	3 00
Best display of shoe lasts, pegs and lasting machine	3 00
Best pair of dress boots	2 00
Best pair of heavy boots	2 00
Best pair of gents' dress shoes	2 00
Best pair of Congress gaiters	2 00
Best pair of ladies' gaiters	1 00
Best pair of ladies' slippers	1 00
Best pair of bootees	1 00
Best display of bound account books	5 00
Best display of paper	5 00
Best display of paper hangings and borders	3 00
Best silk hat	2 00
Best soft hat	2 00
Best fur cap	2 00
Best made suit of gentlemen's clothing	5 00
Best display of printing	5 00
Best display of gloves and mittens	3 00
Best display of ladies' furs	3 00

FOURTH DEPARTMENT.

MECHANICAL PRODUCTS.

All products of industry competing for premiums are to be exhibited by or for the maker or improver or inventor.

CLASS I—WORKED METALS.

Article.	Premium.
Best display of copper work	$5 and D.
Best display of brass work	$5 and D.
Best display of axes	$3 00
Best display of locks	5 00
Best display of door trimmings	3 00
Best display of window trimmings	3 00
Best display of window blind or shutter trimmings	3 00
Best display of saddlers' hardware	5 00
Best display of horseshoes	2 00
Best display of horseshoe nails	1 00
Best display of plumbers' goods and ware	Diploma.
Best display of gas chandeliers and burners	Diploma.
Best display of lamps	3 00
Best display of general hardware	5 00
Best display of iron and steel	3 00
Best display of iron fencing, including post	3 00
Best display of coopers' tools	5 00
Best display of mechanics' tools, other than coopers	5 00
Best display of table cutlery	3 00
Best display of pocket cutlery	3 00
Best display of silverware	5 00
Best display of Britannia ware	3 00
Best display of clocks	3 00
Best display of kitchen utensils of brass or copper	5 00
Best display of kitchen utensils of tin	3 00
Best circular saws	5 00
Best mill saws	5 00
Best hand saws	5 00
Best display of files	5 00
Best burglar and fireproof safe	10 00

CLASS II—STOVES, CASTINGS, ETC.

Article.	Premium.
Best cooking stove for wood	$5 00
Best cooking stove for coal	5 00
Best parlor stove	5 00
Best warming furnace or other apparatus	5 00
Best cooking range	5 00
Best parlor grate	3 00
Best pair ornamental iron vases	3 00
Best specimen of marbleized iron	3 00
Best specimen of marbleized stone	5 00
Best specimen of marbleized wood	5 00
Best display of hollow iron ware	5 00
Best ornamental statuary	5 00
Best ornamental fruit and flower stand	3 00
Best church bell	3 00
Best farm bell	2 00
Best chime of bells	5 00

CLASS III—CABINET WARE.

Best dressing bureau	$5 00
Best sofa	5 00
Best lounge	2 00
Best extension table	3 00
Best office chair	2 00
Best set of parlor chairs	5 00
Best centre table	5 00
Best pair of side tables	3 00
Best set of parlor furniture	10 00
Best display of furniture	10 00
Best display of mattresses	5 00
Best seats and desks for schools	3 00
Best writing desk	2 00
Best book-case	3 00
Best wardrobe	3 00
Best sick chair or couch	3 00

CLASS IV—WOODEN WARE.

Best display of cedar ware	$3 00
Best display of pine ware	3 00
Best display of oak ware	3 00
Best display of window shades	2 00
Best display of window blinds	3 00
Best display of willow ware	3 00
Best display of split wood baskets	2 00
Best display of pine, oak or walnut doors	3 00
Best display of flour, pork and tight barrels	3 00
Best display of grain measures	2 00
Best display of butter firkins	2 00
Best display of worked flooring	2 00
Best display of turning lathe work	3 00
Best display of osier willow	2 00
Best wine cask	F. Diploma.

CLASS V—PHILOSOPHICAL, SURGICAL, DENTAL, DRAWING, PAINTING, SURVEYING AND LEVELLING INSTRUMENTS AND APPARATUS, ETC., OF FINE WORKMANSHIP, EXHIBITED BY MAKER—AMERICAN MANUFACTURE.

Article.	Premium.
Best surgical instruments	Diploma.
Best set optical instruments	1 iploma.
Best dentists' instruments	Diploma.
Best set of mathematical and philosophical instruments	Diploma.
Best specimens dentistry	Diploma.
Best theodolite	Diploma.
Best level	Diploma.
Best surveyor's compass	Diploma.
Best achromatic telescope	Diploma.
Best reflecting telescope	Diploma.
Best optical apparatus	Diploma.
Best balance	Diploma.
Best thermometer	Diploma.
Best barometer	Diploma.
Best electro-magnetic apparatus	Diploma.
Best electric telegraph	Diploma.
Best electric machine	Diploma.
Best galvanic battery and apparatus	Diploma.
Best set drawing instruments	Diploma.
Best chronometer	Diploma.
Best clock (eight day)	Diploma.
Best specimen silverware, with agricultural designs, suitable for premiums	Diploma.
Best specimen Argentine or Britannia ware	Diploma.
Best turned and cast Britannia	Diploma.

CLASS VI—CHEMICALS.

Best ivory black	$1 00
Best Prussian blue	1 00
Best copal varnish	2 00
Best glue	1 00
Best prussiate of potash	1 00
Best linseed oil	1 00
Best white lead	1 00
Best display of soap	2 00
Best display of candles	2 00
Best specimen of lard oil	1 00
Best quart of castor oil	4 00
Best display of potash, saleratus, pearlash and other alkalies	2 00
Best display of writing fluid	1 00
Best display of blacking	1 00
Best display of lubricating petroleum	3 00
Best display of illuminating petroleum	3 00

CLASS VII—GLASS, CROCKERY, STONEWARE, BRICKS AND TILES—AMERICAN MANUFACTURE.

Best specimen Rockingham ware	Diploma.
Best stoneware	Diploma.
Best specimen ground glass	Diploma.
Best specimen stained glass	Diploma.
Best water pipe of water lime	Diploma.
Best sample drain tile	$5 00
Best roofing tiles	3 00
Best flooring	3 00
Best looking glass	Diploma.
Best plate glass	Diploma.

Article.	Premium.
Best window glass	Diploma.
Best flint glass	Diploma.
Best bottle glass	Diploma.
Best bottles, green glass	Diploma.
Best vials, green glass	Diploma.
Best tincture and other stoppered bottles and vials	Diploma.
Best retorts and receivers, tubulated and plain	Diploma.
Best demijohns	Diploma.
Best carboys	Diploma.
Best terra cotta	Diploma.
Best fire bricks	$3 00
Best pressed brick	Diploma.
Best pottery, various kinds	Diploma.
Best display of stoneware	$3 00
Best display of glassware	3 00
Best display of queensware	5 00
Best dressed stone	3 00
Best mill stone	5 00
Best marble of California	5 00
Best barrel common salt	3 00
Best sack table salt	1 00
Best barrel lime	2 00
Best hydraulic cement	3 00

CLASS VIII—MINERALS, FOSSILS, BIRDS, FISHES, ETC.

Best set of useful minerals of California, including coals of California, iron ores of California, limestones of California, marbles of California, sandstones of California, marls of California, peats of California, soils of California, salt waters of California, minerals of California, potters' clay of California, fire clay of California, burr stones of California, gypsum of California—twenty dollars.

For the following articles, such awards as the Board shall deem best, on the recommendation of the Committee, will be made:

Best collection of minerals illustrating the geology of California.

Best collection illustrating the ornithology of California.

Best collection of natural fishes, living or dead.

Best suit of crystalized minerals of California.

Best suit of crystalized minerals from all parts of the world.

Best suit of fossils of California.

Best suit of the vegetable kingdom, including the woods and most useful plants, and native grasses of California.

Best suit of the animal kingdom, including insects injurious to the farmer.

FIFTH DEPARTMENT.

AGRICULTURAL PRODUCTS.

FARM PRODUCTS, FOOD, CONDIMENTS, ETC.

CLASS I—SILK.

Best exhibition of the silk business, from the mulberry tree to the silk cocoon, including the feeding of the worms, their eggs, etc., fifty dollars.

CLASS II—FIELD CROPS.

To avoid the expense of a Visiting Committee and to secure more satisfactory results, the Board have determined to award the premiums for field crops at the annual meeting in January; those awards to be made upon statements and affidavits, in accordance with forms hereto annexed.

Article.	Premium.
Best crop of wheat, not less than ten acres, nor less than fifty bushels per acre	$30 00
Best crop of barley, not less than ten acres, nor less than seventy bushels per acre	30 00
Best crop of oats, not less than ten acres, nor less than seventy bushels per acre	30 00
Best crop of Indian corn, not less than sixty bushels per acre	30 00
Best crop of rye, not less than ten acres, nor less than fifty bushels per acre	30 00
Best crop of buckwheat, not less than ten acres, nor less than fifty bushels per acre	30 00
Best crop of beans, not less than two acres, nor less than fifty bushels per acre	20 00
Best crop of castor beans, not less than five acres	25 00
Best crop of field peas, not less than two acres, nor less than thirty bushels per acre	15 00
Best crop of potatoes, not less than two acres, nor less than three hundred bushels	15 00
Best crop of sweet potatoes, not less than two acres, nor less than three hundred bushels	15 00
Best crop of sugar beets, not less than five acres, nor less than forty tons per acre	25 00
Best crop of carrots, not less than two acres, nor less than six tons per acre	15 00
Best yield of alfalfa on two acres of land for the season, stating how many times the same was cut	15 00
Best crop of hops, not less than ten acres, nor less than fifteen hundred pounds per acre	25 00
Best crop of broom corn, not less than five acres	15 00
Best crop of tobacco, not less than five acres, nor less than fifteen hundred pounds cured tobacco per acre	25 00
Best crop of cotton, not less than five acres, nor less than four hundred pounds per acre	25 00
Best field of grapes from not less than five thousand vines	25 00
Not less than ten thousand vines	30 00

Article.	Premium.
Wine from Native Grapes.	
Best yield of wine, quantity and quality considered, from not less than twenty-five hundred vines	$15 00
From not less than five thousand vines	25 00
From not less than ten thousand vines	30 00
Wine from Foreign Grapes.	
Same premiums as for native.	

STATEMENT

To accompany application for premiums to be awarded at the annual meeting in January:

First—Statement of the next previous crop, if any, and how measured, if at all.

Second—The kind and condition of the soil, whether Summer fallowed, or how cultivated, and the time and manner of sowing, quantity and kind of seed.

Third—The expense of sowing and harvesting, as near as may be, and the value of the crop, so as to determine the profits.

Fourth—A sample of the crop must be presented at the annual meeting.

Fifth—In the case of vineyards—the location of same, kind of soil, manner of cultivation, time and manner of pruning, and process of picking fruit and making wine. Also, the kinds of grapes used, and any other facts that may be beneficial to the public.

Sixth—The land from which the crop for which a premium is claimed must be in one contiguous piece, and must be measured so as to show the exact quantity, to which the applicant must make affidavit; and, unless all these conditions are complied with and statements made, no premiums will be awarded.

FORM OF AFFIDAVIT FOR APPLICANTS.

STATE OF CALIFORNIA, ——— County. } ss.

——— ———, being duly sworn, deposes and says that he raised a crop of ——— the last past season upon ——— acres of land [state how and by whom measured], and that the quantity [of grain, or as the case may be] was ——— pounds per acre [in case of vineyards, number of pounds of grapes, or number of gallons of wine for stated number of vines], and that the statement annexed, subscribed by this deponent, as to the manner of cultivation, expenses, etc., is in all respects true, to the best of his knowledge and belief, and that the sample of [wheat, potatoes, or as the case may be] is a fair sample of the whole crop for which I claim a premium.

——— ———.

Sworn to and subscribed before me this ——— day of ———, 186—.

——— ———, J. P., ——— County.

It is hoped by the Board that the farmers of the whole State will take pains to make a good showing of all the different crops of the State, not so much to obtain premiums offered as to exhibit to the world what California can do in an agricultural point of view.

The statements in full, as well as the awards of premiums, will be published in the Society's Annual Transactions, and go the world over. Then let the farmers look to their State's reputation.

CLASS II.—FLOUR AND GRAIN.

All parties desiring to compete for premiums on flour, wheat or barley, and who will send the required samples to be exhibited to J. W. H. Campbell, San Francisco, or to Carroll, Smith & Co., Sacramento, will be paid the market price for the flour or grain, and the same will be properly labelled with the producer's name and be exhibited for him; and also, will be paid any premiums awarded to the same. The object of this arrangement is to secure a good exhibition and to save trouble to the producer.

Article.	Premium.
Best sack wheat flour (California manufacture and California wheat)	$15 and D.
Best sack red wheat flour (to be exhibited by the manufacturer, with a statement of the variety and quantity of wheat necessary to make it)	$15 00
Best two bushels of wheat of the Chile variety	10 00
Best two bushels of wheat of the Australian variety	10 00
Best two bushels of the Club variety	10 00
Best two bushels of any other variety	10 00
The premium wheat to become the property of the State Board of Agriculture.	
Best sample of rye, not less than one-half bushel	5 00
Best sample of oats, not less than one-half bushel	5 00
Best sample of barley, not less than one-half bushel	5 00
Best sample of buckwheat, not less than one-half bushel	5 00
Best sample of flax seed, not less than one-half bushel	5 00
Best sample of hops, not less than twenty-five pounds	5 00
Best sample of timothy, not less than one-half bushel	5 00
Best sample of clover seed, not less than one-half bushel	5 00
Best sample of blue grass seed, not less than one-half bushel	5 00
Best sample of red-top seed, not less than one-half bushel	5 00
Best sample of orchard grass seed, not less than one-half bushel	5 00
Best half bushel yellow corn	5 00
Best half bushel white corn	5 00
Best half bushel early corn	5 00
Best exhibit garden seeds of California production, not less than twenty-five varieties	20 00

Evidence must be presented showing that the grain, vegetables and products have been grown by the exhibitor.

CLASS III.—CHEESE (DOMESTIC MANUFACTURE).

Article.	Premium.
Best cheese, one year old and over	$15 00
Best cheese, under one year old	15 00

CLASS IV.—CHEESE (FACTORY MADE).

Best cheese, one year old and over	$15 00
Best cheese, under one year old	15 00

CLASS V.—SWEEPSTAKES ON CHEESE.

For the best and largest display of cheese, diploma and twenty dollars.

CLASS VI—BUTTER, BREAD, ETC.

Article.	Premium.
Butter.	
Best lot ten pounds of butter, in rolls	$10 00
Best tub or firkin, not less than twenty-five pounds, at least three months old	15 00
Bread and Cereal Food.	
Best four loaves of bakers' bread not less than forty-eight hours old	$3 00
Best pilot bread	2 00

Article.	Premium.
Best biscuit	$2 00
Best soda biscuit	2 00
Best crackers, butter	2 00
Best crackers, sweet	2 00
Best crackers, Boston	2 00
Best domestic corn bread	3 00
Best domestic rye bread	3 00
Best domestic brown bread	3 00

CLASS VII—HONEY, PRESERVES, PICKLES, ETC.

Best ten pounds honey	$5 00
Best canned tomatoes	3 00
Best canned blackberries	3 00
Best canned raspberries	3 00
Best canned peaches	3 00
Best canned pears	3 00
Best canned apples	3 00
Best canned quinces	3 00
Best canned cherries	3 00
Best canned gooseberries	3 00
Best canned currants	3 00
Best canned grapes	3 00
Largest and best variety of canned fruits	Diploma.
Largest and best variety of canned jellies	Diploma.
Largest and best variety of canned preserves	Diploma.
Best apple jelly	3 00
Best currant jelly	3 00
Best peach jelly	3 00
Best quince jelly	3 00
Best preserved quinces	3 00
Best preserved peaches	3 00
Best preserved pears	3 00
Best preserved apples	3 00
Best preserved plums	3 00
Best tomato catsup	3 00
Best cucumber catsup	3 00
Best pickled cucumbers	3 00
Best pickled peaches	3 00
Best pickled tomatoes	3 00
Best pickled walnuts	3 00
Best pickled mangoes and melons	3 00
Best pickled onions	3 00
Best pickled gherkins	3 00
Best specimen of concentrated vegetables	3 00
Best specimen of concentrated milk	3 00

CLASS VIII—WINES, SUGARS, SYRUP AND BRANDY.

White Wines.	
Best white still wine, four years old	$10 00
Best white still wine, three years old	10 00
Best white still wine, two years old	10 00
Best white still wine, one year old	10 00
Red Wines.	
Same premiums as white wines.	
White Sparkling Wines.	
Same premiums as white still wines.	

Article.	Premium.
Other Wines.	
Best port wine	$10 00
Best claret wine	10 00
Best sherry wine	10 00
Best exhibit of wines from foreign grapes	10 00
Best exhibit of wines from native grapes	10 00
Brandy.	
Best brandy made from grapes one year old	5 00
Best brandy made from grapes two years old	10 00
Best brandy made from grapes three years old or over	15 00
Sugar and Syrup.	
Best one hundred pounds made from sugar beet	20 00
Best one hundred pounds made from Chinese cane	10 00
Best ten pounds made from corn	10 00
Best five gallons syrup from either of the above named articles	5 00

CLASS IX—VEGETABLES, ROOTS, ETC.

All articles in this class to be raised by the exhibitor.

Best half bushel red potatoes	$5 00
Best half bushel white potatoes	5 00
Best half bushel of any other variety	5 00
Best and greatest variety of Irish potatoes, half peck of each variety	5 00
Best half bushel of sweet potatoes	5 00
Best twelve parsnips	2 00
Best twelve carrots	2 00
Best six long blood beets	2 00
Best six turnip beets	2 00
Best six sugar beets	2 00
Best display of beets in variety and quality	3 00
Best peck of tomatoes	2 00
Best display of tomatoes, variety and quality	3 00
Best six drumhead cabbages	2 00
Best six heads of red Dutch cabbage	2 00
Best six heads of any other variety	2 00
Best three heads of cauliflower	2 00
Best three heads of broccoli	2 00
Best six heads of lettuce	1 00
Best half peck of red onions	1 00
Best half peck of yellow onions	1 00
Best half peck of white onions	1 00
Best display of onions in variety and quality	5 00
Best half peck of peppers for pickling	1 00
Best display of peppers in variety and quality	1 00
Best twelve roots of salsify	1 00
Best six stalks of celery	2 00
Best six marrow squashes	2 00
Best six Hubbard squashes	2 00
Best six crookneck squashes	2 00
Best display of squashes, variety and quality	4 00
Best and largest pumpkin	1 00
Best display of pumpkins, variety and quality	3 00
Best dozen of sweet corn, green	2 00
Best display of sweet corn in variety and quality, green or dry	3 00
Best three mountain sweet watermelons	2 00
Best three watermelons of any other variety	2 00
Best three green-fleshed muskmelons	2 00
Best three yellow-fleshed muskmelons	2 00
Best and greatest display of melons of all varieties, both watermelons and muskmelons	5 00

Article.	Premium.
Best six cucumbers	$1 00
Best half peck Lima beans, in pod	2 00
Best half peck white beans, dry	2 00
Best half peck kidney bush beans, in pod	2 00
Best half peck pole beans, other than Lima, in pod	2 00
Best half peck field peas, dry	1 00
Best half peck garden peas, dry	2 00
Best half peck castor oil beans	4 00
Best and greatest variety of peas, dry	3 00
Best half peck gherkin cucumbers	1 00
Best three purple egg plants	2 00
Best and greatest variety of vegetables raised by one exhibitor	15 00

SIXTH DEPARTMENT.

FRUITS.

CLASS I—GREEN FRUITS.

Article.	Premium.
Apples.	
For best twenty varieties, best grown and correctly named	$15 00
For best twelve varieties, correctly named, six specimens of each	10 00
Pears.	
For best twenty varieties, best specimens and correctly named, three specimens each	10 00
For best twelve varieties and best specimens, six of each, correctly named	10 00
Peaches.	
Best twelve varieties and best grown specimens, at least three of each, correctly named	10 00
Best six varieties and best grown specimens, six of each, correctly named	4 00
Best one variety, twelve specimens	2 00
Plums.	
Best twelve varieties and best grown specimens, six of each, correctly named	5 00
Best six varieties, six specimens each	4 00
Best one variety, twelve specimens	3 00
Nectarines.	
Greatest number of varieties and best specimens, correctly named	5 00
Best one variety, twelve specimens	3 00
Quinces.	
Best dozen apple or orange	5 00
Grapes.	
Greatest number of good native varieties and best grown specimens, three or more bunches each	10 00
For best one variety, six bunches	3 00
Greatest number of varieties and best specimens of foreign grapes, three bunches each	10 00
Best one variety, for dessert or table use, for raisins and wine	5 00
Figs.	
Greatest number of varieties and best specimens	5 00
Best one variety, twelve specimens	3 00

Article.	Premium.
Prunes.	
Greatest number of varieties and best specimens	$3 00
Best one variety, twelve specimens	3 00
Oranges.	
Greatest number of varieties and best specimens	5 00
Best one variety, six specimens	3 00
Lemons.	
Greatest number of varieties and best specimens	5 00
Best one variety, six specimens	3 00

CLASS II—DRIED AND PRESERVED FRUITS, NUTS, ETC.

Greatest number of varieties and best specimens, not less than three pounds each	$25 00
Best dried figs, prepared so they will keep in condition for export, not less than six pounds	5 00
Best twenty-four pounds raisins	15 00
Best ten pounds dried prunes	10 00
Greatest number of varieties and best specimens of fresh-preserved fruits, not less than one jar each nor less than six varieties	25 00
Cultivated Nuts.	
Best half peck English walnuts	3 00
Best half peck soft-shelled almonds	3 00
Best half peck peanuts	2 00

SEVENTH DEPARTMENT.

FINE ARTS.

CLASS I—DRAWINGS, PAINTINGS, ETC.

Article.	Premium.
Best life-size photograph, colored in oil, by California artist	$10 and D.
Second best life-size photograph, colored in oil, by California artist	$5 and D.
Best specimen of painting, in oil, by American artist	$20 00
Same by California artist	20 00
Best specimen in water colors	Diploma.
Best specimen in oil, by foreign artist	20 00
Best specimen in water colors, by foreign artist	20 00
Best specimen uncolored photograph	20 00
Best specimen of not less than twelve different objects of natural history, in water colors, by California artist	$20 and D.
Best specimen fruit painting	10 00
Best specimen flower painting	10 00
Best specimen of California landscape, in oil, by California artist	10 00
Best exhibition of paintings by California or foreign artist	$20 and D.
Best fancy painting	10 00
Best fancy painting in water colors	Diploma.
Best engraving	Diploma.
Best wood engraving	Diploma.
Best lithography	Diploma.
Best porcelain painting and gilding	Diploma.
Best specimen penmanship	$5 00
Best crayon drawing	Diploma.
Best pencil drawing	Diploma.
Best pen drawing	Diploma.

CLASS II—SCULPTURE, ETC.

Best sculpture	$10 00
Best collection of marble work	30 00
Best carving in wood	Diploma.
Best architectural drawings	20 00
Best collection of the greatest variety of insects	$15 and D.
Best collection and greatest variety of California birds, prepared	$15 and D.
Best collection and greatest variety of quadrupeds, prepared	$15 and D.

CLASS III—DESIGNS.

Article.	Premium.
Best design for farm house	$20 and D.
Best design for farm barn	$10 and D.
Best design for carriage house and stable	Diploma.
Best design for dairy house	Diploma.
Best design for poultry house	Diploma.
Best design for farm gate	Diploma.
Best granary	Diploma.
Best bridge (model of)	Diploma.
Best domestic gas apparatus (or model of)	Diploma.

CLASS IV—MUSICAL INSTRUMENTS.

Best grand or semi-grand piano forte	$20 00
Best boudoir piano	20 00
Best square piano	20 00
Best violin	20 00
Best parlor organ	10 00
Best melodeon	5 00
Best melopean	5 00
Best æolian	5 00
Best dulcimer	5 00
Best flute	5 00
Best clarionet	5 00
Best set of band instruments	5 00

STATE PREMIUMS.

The State, through its Legislature, by "An Act for the encouragement of agriculture and manufactures in California," has offered the following liberal premiums, and the Board of Judges, consisting of the Governor of the State, the President of the State Agricultural Society, the President of the Northern District Agricultural Society, the President of the San Joaquin Agricultural Society and the President of the Mechanics' Institute of San Francisco, have determined to have the articles competing for such premiums exhibited at the State Fair, where the Board of Judges above named will examine and award the premiums in accordance with the law:

Article.	Premium.
For the first twenty-five bags of sugar of one hundred pounds each, manufactured from sorghum	$125 00
For the first twenty-five bags of sugar of one hundred pounds each, manufactured from sugar cane	125 00
For the first twenty-five bags of sugar manufactured from beet-roots	125 00
For the first fifty barrels of molasses manufactured from sorghum	50 00
For the first fifty barrels of molasses manufactured from sugar cane	125 00
For the first fifty bales of flax of two hundred pounds each	250 00
For the first fifty bales of hemp of two hundred pounds each	250 00
For the first twenty-five bales of cotton of three hundred pounds each	750 00
For the first fifty bales of tobacco of one hundred pounds each	75 00
For the first two hundred and fifty bales of tobacco of one hundred pounds each	250 00
For the first twenty-five cases of fifty pounds each of manufactured tobacco	62 50
For the first two hundred and fifty cases of fifty pounds each, manufactured tobacco	250 00
For the first two hundred and fifty bales of hops of two hundred and fifty pounds each	250 00
For the first five bales of raw silk of fifty pounds each	250 00
For the first twenty-five bales of raw silk of one hundred pounds each	1,250 00
For the first two hundred and fifty pieces of cotton drilling of forty yards each	500 00
For the first two hundred and fifty bales of cotton drilling of sixteen hundred yards each	1,000 00
For the first two hundred and fifty pieces burlap of forty yards each, suitable for grain sacks	500 00
For the first two hundred and fifty bales of same quality and description, of one thousand six hundred yards each	750 00
For the first two hundred and fifty pieces burlap of forty yards each, suitable for wool sacks	500 00
For the first twenty-five pieces of hemp carpeting, colored, forty yards each	50 00
For the first two hundred and fifty pieces of forty yards each	250 00
For the first twenty-five pieces of linen of forty yards each, suitable for shirts or miners' frocks	250 00
For the first twenty-five pieces of calico of thirty yards each	125 00
For the first two hundred and fifty pieces of calico of thirty yards each	250 00
For the first twenty-five pieces of cotton shirting of forty yards each	250 00
For the first twenty-five pieces of cotton sheeting of forty yards each	250 00
For the first two hundred and fifty pieces of forty yards each of pilot cloths, broadcloths, tweed or cassimeres exported from the State, on each specification	500 00
For the first twenty-five bales of blankets, forty pairs each, exported from the State	250 00

Article.	Premium.
For the first twenty-five pieces of ingrain carpet of sixty yards each	$50 00
For the first twenty-five pieces of Brussels carpet of sixty yards each	50 00
For the first two hundred and fifty pairs of woollen socks	62 50
For the first two hundred and fifty pairs of woollen drawers	75 00
For the first two hundred and fifty woollen undershirts	75 00
For the first twenty-five bales of cottonized flax of twenty-five pounds each	250 00
For the first twenty-five cases of men's boots of twelve pairs each	125 00
For the first twenty-five cases of men's shoes of twenty-four pairs each	125 00
For the first twenty-five cases of women's shoes of thirty-six pairs each	125 00
For the first twenty-five cases of children's shoes of forty-eight pairs each	75 00
For the first five chests of tea of twelve and one-half pounds each	250 00
For the first five sacks of coffee, containing in all, sixty-two and one half pounds	250 00
For the first twenty-five coils of assorted cordage, sizes not less than one inch, and of length not less than sixty fathoms	62 50
For the same quantity tarred	125 00
For the first two and one-half barrels of tar	50 00
For the first two and one-half barrels of rosin	37 50
For the first two and one-half barrels of pitch	37 50
For the first twenty-five gallons spirits of turpentine	62 50
For the first twenty-five reams of printing paper manufactured from cotton	125 00
Manufactured from any material the same premium, and for the first two hundred and fifty reams manufactured	250 00
For the first book of not less than seventy-five pages, on the mining and and industrial resources of California, printed on California paper, stitched with California thread and bound in California skins and boards	125 00
For the second of the same character and description	62 50
For the third	37 50
For the first two hundred and fifty dozen glass wine bottles	375 00
For the first two hundred and fifty cases bottled beer of two dozen each, exported and proved to withstand sea voyages	375 00
For the first twenty-five packages of linseed oil of twenty gallons each	250 00
For the first twenty-five packages of cotton seed oil of twenty gallons each	250 00
For the first plantation of cotton of not less than two and one-half acres in bearing, of good staple	250 00
For the first twelve and one-half acres of cotton in bearing, of good staple	500 00
For the first twenty-five acres of cotton in bearing, of good staple	750 00
For each plantation of five thousand or more mulberry trees, two years old, before the second day of April, eighteen hundred and seventy	250 00
For each one hundred thousand silk cocoons	300 00

NOTICE.—For double the quantity of each article named above, double the premium, and for four times the quantity, four times the premium named will be given.

All articles competing for State premiums must be entered for that purpose and notice must be given to the Entry Clerk to that effect when entered, and they must have a card attached marked "State premiums." Samples of the same articles may be entered for the premiums of the Society.

RULES.

RULE I.

Each member of the California State Agricultural Society will be furnished with a ticket, bearing his own name, at the office of the Secretary, upon a presentation of his certificate of membership, to transfer or loan which will subject him to expulsion from the society and exclusion from any of its benefits in future.

RULE II.

Price of single admission to the Pavilion or Stock Grounds, fifty cents. Membership tickets, admitting a member with his family at all the exhibitions at Stock Grounds and Hall, five dollars. Officiating clergymen, editors and delegates from Agricultural Societies will be presented with a complimentary card of admission on application at the office of the Secretary. No horse will be allowed to be hitched to a tree or any fixture of the Grounds.

RULE III.

Exhibitors must see to the delivery of their articles upon the Grounds or at the Hall to the superintendent of the appropriate department.

RULE IV.

All exhibitors who intend to compete for the premiums of the Society must become members of the same, and all must have their animals entered at the office of the Entry Clerk at the Park, and articles for the Hall at the office of the Entry Clerk in the Hall, not later than twelve o'clock M. of Tuesday, the fifteenth of September, so that they may be arranged in their respective departments and in readiness for examination by the Judges. But this rule shall not apply to such articles or animals as have been exhibited this year at any one of the District or County Fairs held immediately previous to the State Fair, and which are not discharged in time to be here on the opening day, nor to specimens of fruit, except as to mulberry trees and cocoons, and as to them one half or one quarter the quantity named will be paid one half or one quarter the premium named.

RULE V.

The society will not be responsible for the omission to exhibit any article or animal not entered strictly in accordance with its rules.

RULE VI.

No article or animal entered for premium can be removed or taken away before the close of the exhibition without special permission. No premiums will be paid on articles or animals removed in violation of this rule.

RULE VII.

All articles and animals entered for exhibition must have cards, with the numbers and names of the exhibitors, as entered by the Entry Clerk; and exhibitors in all cases must obtain their cards previous to placing their articles or animals on exhibition. Cards for animals must be placed in a conspicuous place on the stalls or pens, and cards for other articles will be attached to them.

RULE VIII.

Those who wish to offer articles or animals for sale during the Fair must notify the Secretary of the same at the time of entering, and have a card attached or posted on stall or pen, stating that they are for sale, with the owner's name, price, etc.

RULE IX.

The Board of Directors will use every precaution in their power for the safe preservation of all articles and stock on exhibition, but will not be accountable for loss or damage. Exhibitors must give attention to their articles or animals during the Fair, and at the close of the exhibition attend to their removal.

RULE X.

Judges will be selected with reference solely to the highest order of fitness; provided, always, that no person will be permitted to act as Judge in the same department where he is competitor.

RULE XI.

In no cases can the Judges award special or discretionary premiums, but may recommend to the Board of Directors any articles in their class which they may deem worthy of special notice, and for which a premium has not been offered.

RULE XII.

No stock of inferior quality will be admitted within the Grounds. A Committee will be appointed to rule out all below a medium grade.

RULE XIII.

No person will be allowed to interfere with the Judges during their adjudications, and any person who shall attempt to interfere with them, whether verbally or otherwise, shall be excluded from competition.

RULE XIV.

The Superintendents of Departments will receive the award books from the Secretary and deliver them to the proper Judges in their respective departments, will afford the Judges every facility for examination, point out the articles or animals to be examined, attach prize cards to the articles, or flags to the successful animals, under the direction of the Judges, and when the awards are finished and entered in the books, will receive them from the Judges and return them carefully to the President or Secretary, allowing no person to handle or examine them, except specially authorized so to do; as upon the entries of awards in them, signed by the Judges, and upon no other authority, can orders or checks for premiums be drawn.

RULE XV.

The General Superintendent of the Stock Grounds will see that they are in proper order for the reception and exhibition of the stock of all kinds, and for the comfort and convenience of exhibitors and visitors; that proper supplies of food for stock, and water for all purposes, are on the ground and convenient of access. He will direct exhibitors, on their arrival and after the entry of their animals, to proper stalls or departments on the Grounds, and in connection with the Superintendents of Departments will see that all classes of stock are ready for exhibition or parade at the exact time and in the particular manner as specified in the programme, and will exercise a

general supervision over the Grounds, preserving order and decorum. The General Superintendent of the Hall will see that the same is in proper order for the reception and exhibition of all articles to be exhibited therein, and for the comfort and convenience of exhibitors and visitors. He will have the nomination of his assistants, and will assign them to their particular duties in the several departments. He will receive and direct the location, classification and arrangement of all articles entered for exhibition, and will exercise a general supervision throughout the Hall, preserving order and decorum during the Fair. The General Superintendent and Superintendents of Departments will also be vested with all the powers and prerogatives with which Constables are invested, so far as acts or offences committed within, or with reference to, or in connection with the Exhibition are concerned, and they shall be responsible to the Board of Directors for the proper management of their departments.

RULE XVI.

No animal can compete in more than one class, unless the exception is made in the schedule.

RULE XVII.

Animals, when duly entered, will be furnished with hay for food and straw for bedding, free of charge; but all grain must be paid for by the exhibitors, at market price, except grain for swine and poultry.

A depot for grain will be established on the Grounds.

RULE XVIII.

All machines, implements or other products of mechanical art must be exhibited by their respective makers or inventors, or improvers, or their assignees, to or for whom only premiums for such articles will be awarded. Any fictitious entries will subject the participants in the fraud to forfeiture of all premiums awarded, as well as exclusion from competition at any future exhibition of the Society.

RULE XIX.

The General Superintendents, Superintendents of Departments and the Judges of stock or articles exhibited at the Park will assemble at the office of the Board at the Park on Wednesday, the fifteenth, at nine o'clock and thirty minutes A. M., precisely, where all will receive instructions and the President will deliver to the Judges their award books, and the Superintendents will conduct them to their respective departments for the commencement of their work. The Superintendents and Judges of articles exhibited at the Hall will assemble at the same time at the office of the Secretary, at the Hall, for the same purpose. All vacancies in the Board of Judges will then and there be filled, so that all will be expected to be present at that time. This is important, as upon a proper commencement depends the success of the examinations and awards, and upon these the general satisfaction of exhibitors.

RULE XX.

All who intend exhibiting and competing for premiums will confer a great favor on the Society by forwarding their entries by mail to the Secretary (I. N. Hoag), at Sacramento, at least one week before the Fair. This will enable the Secretary to have the entries made seasonably and without confusion, and all the requisite tickets ready in a letter envelop for delivery on demand, when the party arrives and calls for them.

RULE XXI.

Premiums are payable in cash, except where diplomas are specified. The diplomas will be delivered at the State Agricultural Rooms, in Sacramento, as soon as they can be prepared or engraved, or will be forwarded as directed, to the proper persons by the Secretary. Premiums will be paid by the Treasurer, only on the order of the President and Secretary, and will be delivered by the Secretary on the last day of the Fair. These orders must be indorsed by the party to whom they are made payable.

RULE XXII.

When a majority of Judges on any section are present, they shall constitute a quorum and be authorized to award premiums; and the first on the list of those present shall be Chairman.

RULE XXIII.

The Judges will give the reasons in writing for their decisions, as far as practicable, embracing the valuable and desirable qualities of the article or animal to which a premium is awarded.

RULE XXIV.

No article will be excluded on account of having taken a premium at previous Fairs.

RULE XXV.

Should Judges not be satisfied of the regularity of the entries in their respective classes, they will apply to the Entry Clerk for information ; and should there still be any doubt, after examination, or if any article or animal is of such a character as not to be entitled to exhibition in competition, they will exclude from their award all such articles or animals.

RULE XXVI.

Discretionary premiums will be awarded by the Board of Directors, should objects of special interest not provided for in any of the classes be presented.

RULE XXVII.

All instruments, machines, utensils and apparatus intended to be used in the preparation, culture or seeding of the soil, in the harvesting, manufacture or transportation of produce, or in the various requirements of agriculture, or in promoting the comfort of agriculturists and their familes, will be admitted to the exhibition, whether in competition or not.

RULE XXVIII.

Sales may be made by exhibitors during the Fair, under such regulations as the Board of Directors may hereafter prescribe ; but the articles shall not be removed without the special permission of the President.

RULE XXIX.

The exhibition in the cattle ring or on the track will take place punctually at the hour specified in the programme.

RULE XXX.

The Judges will report not only the animals and articles entitled to premiums, but also those next in merit in each class, to meet the contingency of any legal objection which may arise to the awards, and also that they may receive suitable commendation.

RULE XXXI.

Judges are particularly requested to hand their awards to the President or Secretary, as the case may be, as soon as their decisions are made, and write out their reports, giving the reasons of their awards, and hand to the Secretary before the close of the Fair, that they may go into the Transactions of the Society. If longer time is needed in any particular case, apply to the Secretary for copies of awards.

RULE XXXII.

Exhibitors of all animals must place the names of the animals and the particular breed to which the animal belongs, and also their own name and address, in a conspicuous place on their respective stalls.

RULE XXXIII.

No animal to be entered in the name of any other than the *bona fide* owner. Should any be entered otherwise, they will not be allowed to receive a premium, although awarded by the Judges.

RULE XXXIV.

No person other than the Judges will be permitted to go into the ring where stock is exhibited, except the officers of the Society or Marshals. No stock will be permitted to enter the Grounds unless under halter and in the care of a groom.

RULE XXXV.

Purity of blood, as established by pedigree, symmetry, size, early maturity and general characteristics of the several breeds of animals to be considered; and the Judges will make proper allowance for age, feeding and other circumstances.

RULE XXXVI.

There will be a grand parade of all the stock on exhibition at eleven o'clock each day, and a failure of any stock to appear at that hour will exclude such stock from competition for premiums. All persons having stock on the Grounds will see to it at that hour, as the rule will be strictly adhered to.

ERRATUM.—Under the head of State premiums, on page 605, Appendix, the names of the State Board of Judges are erroneously given—those for eighteen hundred and sixty-seven being given, instead of those for eighteen hundred and sixty-eight. The present Board are as follows:

STATE BOARD OF JUDGES:

H. H. HAIGHT.....ALAMEDA.
CHARLES F. REED.....YOLO.
J. K. DOAKE.....CALAVERAS.
D. E. KNIGHT.....YUBA.
A. S. HALLIDIE.....SAN FRANCISCO.

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